TECHNOCRACY DIGEST

AUG. 60

The Propaganda Advantage

For Sale—Junk!

The Freedom We Seek

Largest Belt Conveyor

Fingernail-Size Genie

Coal Stripper Deluxe

Radar Burglar Alarm

New Look For Logging

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TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

AUGUST, 1960 No. 177

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The Quarterly Survey

Tough Times Ahead

The results of a recent survey of Canada's economy as reported in the Toronto-published **Finanical Post** shows business activity in Canada to be slowing down. With this year's slow growth rate offering such a contrast to last year's faster pace, says the **Post,** there's speculation about a possible downturn making itself felt in production, employment and incomes by next winter.

The survey describes Canada's two-year-old expansion as looking increasingly tired, though some production records are expected to be set, despite the country's gross national product having increased only in the first quarter of the year. While some business leaders still express optimism, thoughtful observers are becoming more cautious about the prospects. Allan Beckett, Toronto economic consultant, takes the following view:

'The declines that are already apparent, apart from seasonal factors, will tend to cumulate for the rest of 1960 and, when the returns are in from the outlying months, we will document this as a recessionary period, one which got under way probably in May or June.' He bases his forecast on a number of substantiating factors:

—Among the seven leading indicators which traditionally anticipate turns in the economy as a whole, only corporate profits

Herblock in The Washington Post & Times-Herald
"Split-level living."

continue to advance, seasonal factors discounted. Declines are apparent among: stock prices, new contracts for housing and other building, average hours of work in manufacturing, basic industrial material prices, new orders for producers' durable goods.

—Among the business indicators which tend to move as the economy moves, more weaknesses are putting in an appearance. Industrial employment hit its peak as long ago as last October. Unemployment, seasonal factors apart, has been higher in only three months in the whole postwar period. Industrial production and carloadings are both off. Easter's retail sales did not pierce the peaks of last fall.

After taking seasonal factors into consideration, says Beckett, recent trends in the various Canadian manufacturing industries should be noted by business planners: Total metal production is declining; fuel production has been flat since the end of 1959; food and beverage output registered weakness in the last quarter of last year; rubber products suffered a decline throughout 1959; leather products are down, as is the output of clothing; iron and steel products are having their own little recession; transportation equipment makers are producing well below 1956-57 peaks; non-metallic mineral output has been on the downgrade since last October.

While the foregoing report fefers specifically to Canada, the same trends are evident throughout the U.S. industry. The Price System economy of North America is showing accelerating signs of deterioriation as both domestic and external technological pressures mount against it. We had better get rid of it before it gets rid of us.

Income Distribution

'One-third of a nation—ill-fed, ill-clothed, and ill-housed'—this was one of the many phrases with which Franklin D. Roosevelt characterized the state of the union a generation ago. Conditions have obviously improved greatly since those dark depression days. But a recent published study of the distribution of wealth in the U.S. prepared by the National Bureau of Economic Research, reveals that the nation's affluence is not as wide-

spread as we are often told it is.

The poorest one-third of the nation owns only one per cent of the wealth of the United States. Another twenty-three per cent just above on the economic ladder owns five per cent. Thus, substantially more than half of the population owns only six per cent of America's material assets. This group doubtless corresponds to a great extent with the one-half of U.S. taxpayers that receives annual incomes averaging about $2,000.

In contrast, the richest 1.6 per cent of Americans own nearly one-third of all the nation's wealth. For two decades following the 1929 stock market crash, highly concentrated ownership of wealth declined in favor of a gradual move toward a more equalized distribution. But after 1949 the tide turned, and the trend is once more toward fewer people holding a greater share of the wealth.

The Wall Street Journal added a significant footnote to surveys of income distribution when it reported that despite high taxes government figures indicate 'more individuals have become millionaires since World War II than in any comparable earlier period.'

Some wit has said: 'The rich get richer and the poor get children.' In an economy such as ours, it was inevitable that the disparity in incomes between the suckers and the chiselers should increase. But even the chiselers are starting to have a rough time of it as observed in the lead item of this survey.

★ BRANTFORD, ONT.—The vice-president of the National Home Builders Association says residential construction in Canada may fall by as much as 30% this year and resulting unemployment in the building industry 'would rock our economy.'

John Caulfield Smith of Toronto said here that house construction in the first quarter of 1960 is already 49% below 1959 figures and may average out at 30% below last year's total. He told the Brant County Home Builders Associations 'our association is not pushing the panic button but we believe the public should know residential construction provided jobs for 250,000 in 1959. A 30% decline would mean employment for only 175,000.

Such a drop 'would rock our economy right back to its forests farms and mines,' he said. Smith said the National House Builders Association has recommended to the federal department of public works that royal commission be appointed to conduct a survey of Canada's mortgage prospects. —*Vancouver Sun*

The Propaganda Advantage

The Price System of North America has developed the greatest propaganda mill in the world with the people being its most afflicted victims. There would be no need for propaganda, however, if we did what needs to be done on this Continent.

THERE was a time, just before our entry into World War II, when 'propaganda' was considered a bad word in the United States — the name for a device used by nazis, fascists, communists and others of unsavory character to misinform people. There arose an Institute of Propaganda Analysis in this country to educate the public on the techniques and applications of propaganda. And some of our leading newspapers undertook the task of labelling their news items as to whether they dealt with propaganda, factual reporting, or mere opinion. This objective interest in propaganda did not last long, however.

It was soon discovered by the more discerning citizens that the greatest propaganda mill in the world was the United States, and that the most afflicted victims of it were the American people. Advertising, political campaigning, Chamber of Commerce publicity, governmental white papers, editorials were made up of the rawest kind of propaganda. The education of the youth was loaded with it. When the United States succeeded in entering World War II, we openly espoused the use of propaganda as a national preoccupation, and all serious analysis and critique of propaganda quickly faded away.

Propaganda is a device for influencing the opinion of other people, and it is usually a preparation for the instigation of partisan action. In the use of propaganda, the objective is the all-important thing; the means of achieving it are secondary. Consequently, propaganda approaches the problem of influencing others from every possible angle and with a minimum of compunction. It may make its approach through 'subliminal suggestion,' through emotional appeal or prejudice, or through intellectual analysis — usually in that order of emphasis.

Since propaganda, more often than not, is designed to entice one to a point of view that one would ordinarily reject if the factors involved were clearly understood, it must not be open and honest in its approach; rather, it must employ indirection and circumlocution in an effort to disguise the real purpose.

Propaganda, to be effective, should have some factual content. For the intellectually aware individuals, the factual content should be upwards of fifty per cent. For the moron and 'average man,' it may get by with as little as ten per cent, sometimes less. You have no doubt noted that the purveyors of false religious doctrine often are able to recruit converts with a negligible percentage of factual content, and the same applies to the occult philosophies.

In practice, propaganda is a near kin to education. Theoretically, education is intended to train others in the method and practice of impartial investigation and analysis of things and events with the view of acquiring an understanding of them. However, that is mostly theory. Only in science is the ideal of education approached at all closely; but, even here, after the teachers have been screened and the textbooks have been scanned by highly prejudiced outside interests, the science student gets at least as much propaganda as science in his schooling.

Propaganda, in the public mind, is generally considered as more or less synonymous with lying. A statement may be dismissed as fictitious with the comment, 'Oh, that is just propaganda.' Hence, our official concern over achieving a propaganda victory or advantage over the other side takes on the character of trying to win out in a lying contest.

In connection with our side of the lying contest, we have developed a number of propaganda cliches which fool nobody but sound good to us. We say that the nations on our side, including the most regimented fascist nations on earth, constitute the Free World, while the nations on the other side make up the Slave World. All the propaganda utterances of our side are The Truth, those of the other side are 'a pack of lies.' Thus, we employ freely the propaganda tricks of

name-calling and glittering generalities.

Effective propaganda, however, need not contain **any** overt lies; it may be made up entirely of facts which are verifiable. The objective of propaganda (as distinct from education) is served by the **selection** of the facts—the acceptance of some, the rejection of others. The Russians dramatically illustrated this principle in the case of the infamous U-2 Incident of May 1960. The Soviets gained propaganda prestige by sticking close to the facts. The Americans lost prestige by becoming fouled up in a tangle of lies. As a consequence, even our allies turned to the Russians for information about the incident.

Today, America takes propaganda seriously, both its own propaganda and that of other nations. Any slight propaganda advantage is regarded as a valuable asset. Our governmental agencies are very sensitive in their evaluation of our relative propaganda position in the world; and they actively seek new and more intensive propaganda approaches to the minds of the world's people. Unfortunately for our prestige, there are too many agencies and individuals involved in the creation and promulgation of our propaganda for it to be coordinated and consistent. Different points of view as to what the people of the world should be told results in confusion and loss of respect.

There are some American propagandists who are so naive that they believe their own stuff. Some actually think that they should tell nothing but the truth, although when they come down to it they are not above dressing it up and adorning it a little for the sake of neatness. For example, some think that if they take a composite example of an upper middle-class American family, with a full assortment of real estate, gadgets, and social credentials (all neatly tidied up for public exhibition), and display this concoction to the underprivileged peoples of the world as the typical American family, that those poor people will immediately aspire to become Americans or a reasonable facsimile thereof. But, to chronically impoverished people, that kind of a spectacle is both frightening and disgusting. It is totally strange to their way of living. In-

stead of admiring and wanting to emulate us, they tend to despise and hate us. It reveals to them, among other things, that we are a nation of economic hogs in a world of limited wealth. Of course they want a better way of life, but that does not mean that they want our way. Our avid but naive propagandists thus defeat their own purpose.

To the majority of the world's people, a secure sustenance, with a modicum of essential tools, a modest abode, and some serviceable clothing, constitutes their concept of heaven on earth. In contrast to the American approach, the Russians send technicians and advisors to live with the backward peoples (not in a castle on a hill above them) and show them how to improve their internal operations and increase their economic well-being. They also encourage the people to get their economic hogs off their backs and cooperate with each other for mutual advantage. Thus, the propaganda of communism seems to offer the common man an improved economic condition. It comes closer to their concepts and understanding of what they want than the propaganda that we offer them. The propaganda of Free Enterprise merely offers bigger payoffs to the elite traders and politicians of the backward countries, with a huge take by the foreign exploiter, and little or no improvement for the great majority.

If we study deeper than the mere froth of propaganda words, we are forced to conclude that the primary objective of the present day rulers of the United States is the economic conquest of the world, with full access to the world's resources, by American corporate enterprise. Although that is our Number One objective, we cannot, of course, present it openly as such. So it must be camouflaged with lies and souffled with moral principles. We must make other people (and ourselves) think that we are doing them a favor by robbing them. That is the job of our propaganda agencies—of our United Nations delegation, our State Department, our Justice Department, our Information Office, our Chamber of Commerce, and the White House.

One function of propaganda is to deceive other people; another function is to deceive ourselves.

There are offices in the Executive Branch of our government and sub-committees of Congress whose major occupation is the compiling of misinformation about foreign countries for the indoctrination of American citizens, especially those who intend to travel abroad and those in the overseas armed forces. Much of this information is obtained from testimony of refugees from the respective foreign countries. Actually such testimony is of slight reliability: In the first place, it is highly prejudiced; in the second place, it is embellished for purposes of gaining haven and assistance in another country; and, thirdly, it is often designed for sale to interested parties. After it has been further rewritten and edited by other highly prejudiced persons, any resemblance to the facts is more likely to be coincidental than deliberate. Yet, the United States government turns out this type of propaganda by the millions of copies; unofficial agencies and groups turn out other millions of copies of similar misinformation, much of it in the form of full-page ads in the daily newspapers. Columnists and editors go to work on it after that. As a consequence, the serious traveler abroad is shocked at the discrepancy between what he sees and what he was told to expect. He is in the same boat with the homeland tourist who relies on Chamber of Commerce brochures and travel folders for information about the places he visits only more so, for the latter are merely sucker bait, while the government publications are viciously deceptive. Take, for example, the Hungarian Affair of 1956. Nothing officially published on that event in the United States is worth the paper it is printed on. One must search elsewhere for dependable information.

The use of propaganda is facilitated when the promoters of it have an 'enemy' and a 'program.' Either or both of these may be fictitious or of secondary significance; but they are the focal points for attracting and unifying public opinion. These focal points must be narrow and simple to permit maximum concentration, but they must also be vague enough to permit free play of the imagination.

In commercial propaganda (advertising), the enemy is some anonymous competitor who mar-

kets an inferior product under the name of Brand X. Brand X differs from 'your favorite product' in some ONE feature. This feature may not, in itself, be of intrinsic importance, but that does not prevent its being used as a selling point. You may check these statements against the major advertisements of the A, B, C, D line of products—automobiles, beverages, cigarettes, detergents. In terms of intellectual analysis, the propagandized selling points are silly, but millions of dollars are spent on them in an effort to influence public opinion.

The most vicious propaganda campaigns of history have been waged in the name of religious creeds. In these campaigns, the enemy is the unbeliever (meaning he who does not accept 'our' creed) and the good people are those who believe as we do. The problem of each side is to convert the world to the True Religion and to exterminate the intransigents. Even the most cruel tortures of the body and mind have been accepted as instruments of persuasion, and extermination of the steadfast resisters is often regarded as commendable. The ancient Hebrews had their Philistines, the early Christians had their Pagans, the Moslems had their Christians, the Crusaders had their Infidels, the Catholics had their Protestants, etc. Today, the enemy of the True Faith of the West is 'atheistic materialism,' meaning science and technology, except that, in keeping with propaganda technique, it is not clearly defined as such.

Historically speaking, conflicts over beliefs and philosophies have usually been adjuncts to political and economic competition. . . . When the rulers of one nation wanted to incorporate the geographical territory of some other nation into their own domain, or at least subjugate it to their rule, they have seldom been forthright in saying so. Instead, they have first built up hatred for those whom they intended to disfranchise and built up justification for their own depredations, all in the name of some high moral principle. This principle may be no more subtle than 'bringing civilization to a primitive and immoral people,' as in the case of the fascist Italian invasion of Ethiopia. The

Italians were after territory and resources, that's all.

If the intended victims of our aggression are of another religion, another race, or another politico-economic ideology, hatred can be developed against them by routine propaganda techniques. We can start out by labeling them 'enemies to our way of life,' 'unprincipled and immoral sub-humans,' 'potential aggressors who threaten our very existence.' After concentrated propaganda has done a job on them, the next step is to instigate incidents which will justify counter-action.

For the sake of simplicity, concentration of attention, and obfuscation, the American propagandists have agreed to call the enemy of America 'communism,' and the persons of this 'enemy' are to be described as crude, unsavory characters without common decency or moral compunction. They are **communists** (said with a sneer) which mean, **ipso facto,** they are totalitarian enslavers of humanity, atheistic materialists, and desecraters of Free Enterprise. They are also chronic liars, incapable of telling the truth; so, if one of them says he is not a communist, that proves that he is one. Such is the logic of propaganda.

When a nation contemplates military action against another nation, it must first take careful stock of its propaganda position. It must somehow find and establish moral justification for its action. For one thing, it must claim that the other nation made the first move or at least provoked it beyond the point of reasonable restraint. If the other nation is reasonably large and powerful, it must be accused of aggression against the sovereignty of our nation, of crimes against humanity, and of future evil purposes. The alleged aggressive act of the other nation may be minor in nature, but it should be overt; for example, the blowing up of the battleship Maine in Havana Harbor in 1898. If the contemplated action is against a small nation, then it must be shown that the small nation has been disrespectful of our rights and has insulted our honor; it deserves to be put in its place. An example was the invasion of Guatemala in 1954 over the alleged confiscation of United

Fruit Company property. An arms buildup by our side is always for purposes of defence, even if it includes the production of long-range bombers and intercontinental missiles. But an arms buildup by the other side is always for purposes of aggression against our side.

When some Hungarians were instigated by our side to stage an armed uprising in the autumn of 1956, they were called Freedom Fighters by our propaganda machine; and we maintained that they were honorably justified in rising up and destroying their brutal oppressors. . . . But when, in June 1960, Japanese citizens rose up in protest against an American-imposed military alliance, they were labeled irresponsible terrorists—communists, no less.

As a study in propaganda strategy, it was interesting to note the official American (and Western) attitude toward fascism during and since World War II. Although the actions of Italy, Germany, and Spain were indescribably gory, our official propaganda agencies maneuvered every which way to slur over any condemnation of fascism as such. (There was, however, a great deal of unofficial condemnation of fascism.) While it was admitted that Hitler, Mussolini, and Franco were 'bad boys' who had made a mistake, still we did not condemn the social pattern under which they operated; we played it soft pedal, partly from fear of offending the Vatican. Some effort was directed, propagandawise, to show that Mussolini and Hitler were really atheists at heart, hence expendable, although both had been raised as Roman Catholics and continued to coordinate their policies with those of the Vatican. No atheistic claim could be made against Franco whose Roman Catholicism and Vatican affiliations were unquestioned; so he has never been officially condemned by the United States government, and now he is regarded as a friend and ally. Much of the official propaganda and other official references to the fascism of Italy and Germany tend to treat it as local political party doctrine—Hitlerism or Naziism in Germany, Fascism in Italy. Presumably these obnoxious party doctrines have been wiped out with the

elimination of Mussolini and Hitler from political office. In the meantime, we keep very quiet about the fascism of Spain and Portugal and we refuse to acknowledge its presence in West Germany. Only occasionally does some reporter mention fascism in connection with the De Gaullist government of France.

For some reason, not too well concealed, our propaganda machine is concentrating its venom on 'communism' and dripping with honey where fascism is concerned. No doubt a fascist state would come within the range of the president's concept of 'peace with justice.' A careful analysis of the situation will reveal why. Let us ignore the camouflage and souffle and examine fundamentals.

Who has the loot that our side wants?

Certainly there is nothing in Western Europe or the Free fringe of Asia that any self-interested country would want; they are deficit areas. Eastern Europe and the vast domain of northern and central Asia have the big loot. They have the territory and resources; and they are our competitors in the world market. If the area of the communists could be returned to Free Enterprise, it would be a great market for our goods; and it has innumerable souls to be saved by our missionaries. Western politicians, businessmen, and ecclesiastics would have a field day; the material loot would be tremendous. But, prior to that, the period of conquest presumably would provide us with the greatest war prosperity boom yet known. Private enterprise, two-party politics, and Christian morality then would combine to assemble the loot and divide up the spoils. In all of this, Catholic fascism would be a staunch ally and a major participant. That is the 'positive' side of why our propaganda favors fascism and despises communism.

There is also a 'negative' side. Our side is afraid that, given a fair test, private enterprise is no match for collective enterprise. We are afraid that a two-party political system lacks the decisiveness and efficiency of a one-party political system. And we are afraid of the intellectual freedom and independent self-assertiveness of people who are

not bound by an authoritarian and totalitarian Moral Order.

The preoccupation of the spokesmen of the United States with propaganda advantage indicates that they are in a bad way when it comes to presenting a favorable picture of America to the rest of the world. They are not very eager to present the facts straight. Our deeds have been dubious and erratic, and they have been too often tied in with coercive forcing of subservience to American ideological concepts, military expansionism, and economic exploitation. Other countries have wanted our technology and technical assistance, but they have not wanted our politics, our military intrusions, our business, or our religion. But our leaders have insisted on a tie-in deal. Thereby, we 'lost' Indonesia, Afghanistan, India, and Iraq. Other countries, such as Pakistan, the Phillippines, Japan, Libya, Iran, Greece, Turkey, West Germany, and Britain, have gone along with us part way, tentatively, for the sake of what they might get out of it. We have dumped billions of dollars worth of aid into those countries, but it has all had strings attached. Beyond this, we have spent many millions of dollars on telling others how wonderful we are and how awful are the communists. Now that other countries are coming to the forefront in technology, surpassing the United States in quality of production and undercutting us in price, the foreigners are not too concerned whether or not they get our technology.

Unfortunately, our international propaganda has been on the same intellectual level as our internal propaganda — on the juvenile level. An adolescent level is seldom approached even at the highest levels of responsibility — neither by the president's speeches nor by those of our ambassador to the United States, Henry Cabot Lodge. American Legion speeches and pronouncements are about the lowest of the low in intellectual content. To people trained and disciplined in critical appraisal of what they hear and read, as many foreigners are, the United States must be regarded as a nation of nincompoops. An awful lot of low-quality stuff goes out as official information and policy statements. Even after allowing

for flowery rhetoric, any critical semantic analysis of it would be disastrous.

The official spokesmen and lawmakers of America have seldom if ever been honest and forthright in their statements of policy and position. The statements often are dishonest and evasive of the actions intended. For example, when the president speaks of 'peace with justice,' what does he mean? Certainly it is not just plain ordinary peace, for it does not rule out the possibility of war; he never refers simply to 'peace' as a matter of U.S. policy. Portugal, Saudi-Arabia, Formosa, and Thailand all have 'peace with justice' as near as we can determine. . . . What does the spokesman for the AFL-CIO mean when he tells us that the union members 'are working to keep America strong and free?' In view of other evidence, it is obvious that they are working because they are paid to work, and that they are not very much concerned about the social consequences of what they do. And if the pay or working conditions do not suit them, they are willing and ready to cease 'working to keep America strong and free.'

The spokesmen of a great nation such as the United States do not have to evade facts and resort to lies and distortions — that is, unless they are trying to pull a phony deal. If our leaders are working to pull a big flim-flam on the world, they may have plenty of reason to hide behind subterfuge and slippery maneuvering; and there is plenty of things they do that would not pass open inspection and clear analysis. We hate to think that the leaders of this Continent have sunk that low; but, in the light of what has been transpiring lately, the burden of proof is on their side.

The North American Continent has the resources, the area, the installed power producing capacity, and the trained personnel to achieve the greatest social order ever. We could go ahead and do it without talking about it; and its achievement would speak for us. Facts and achievements do not have to be defended and 'built up' with lies and innuendo. We have seen how the Russians did not have to ballyhoo how they were ahead of the

United States technologically; all they had to do was launch the first sputnik and report it factually and dead pan. The people of the world formed their own opinion of who was ahead.

North America can never gain respect merely through spending hundreds of billions of dollars on negative boondoggles. Armaments soon become obsolescent and must be scrapped. Foreign bases must sooner or later be abandoned. Nothing will be left to show for the great expenditure of effort and resources. But if the same wealth and efforts were applied toward the initiating of constructive works on this Continent, such as a Continental Hydrology System we need not worry about propaganda advantage. We would have something positive to speak for us; besides that, it would be an asset and a continuing benefit to us. As it is, why should tourists come to America to see Grand Coulee Dam, for example, when they can go to Russia and see four that are larger and produce more power? How can you refute a situation like that with propaganda?

Technocracy asks, why fidget and blather about gaining an advantage in a lying contest? Let us do what needs doing here on this Continent. Let achievement speak for us. Then we can forget about the use of weasel words to influence the 'minds of men.'

—Wilton Ivie, CHQ.

★ WASHINGTON—A scientific group has suggested completely automatic highways with electronic devices controlling the speed, course and spacing of vehicles as one way of dealing with increased highway traffic. Electronic control was one of 19 fields of study proposed in a May report by the research board of the National Academy of Sciences.

The board recommended a $34 million increase in research over the next four or five years to improve the highway system on which it is said the American economy is utterly dependent. The board estimated motor vehicle registration will grow from 68 million in 1958 to 110 million by 1975. Highway miles travelled in that period, it said, will increase from 662 billion to 1200 billion.

Highways must be designed to offset human frailties, said board chairman E. H. Holmes. *—United Press International*

(The above item may be new to most people today, but it is old stuff to Technocrats. At least a quarter century ago Technocracy Inc. described and laid down the specifications of the type of electronic traffic control mentioned above. Now, at long last and under the increasing pressure of necessity, the Price System is starting to nibble at the edges of the idea. Cost considerations, however, will prevent its wide scale Price System application.)

The Freedom We Seek

The degree of freedom any people can enjoy depends upon a rich land area, a high energy industrial mechanism and an adequate means of distribution. We have the first two but must institute the last if we are to enjoy real freedom.

FREEDOM is the absence of restraint upon personal activity.

Most people think of it as merely being the opposite of chattel slavery or political bondage, but both of these restrictions can be absent from a society without its people being free. Irrespective of the type of social control in operation in any land area, there can be no great measure of freedom for the people living there unless it possesses the essential ingredients of freedom. These include (1) a large enough land area to be relatively self-contained as to resources, climate, rich food-growing soils, et cetera; (2) an industrial mechanism which is able to convert the natural physical wealth of the area to human use forms; and (3) a distributive mechanism adequate to move the produced goods to waiting consumers without delay or obstruction. The degree of freedom that the people of any land area can enjoy depends largely upon the natural environmental conditions in the first ingredient, and upon the relative operational efficiencies of the other two—having special regard to the proportions in which they use human and extraneous energy.

Using these criteria, how does North America stack up in granting freedom to its citizenry? This is a valid question since North Americans loudly and proudly proclaim their affiliation with that nebulous confederation of nations describing themselves as the 'free world'—a label intended to distinguish them from certain others that do not boast such cherished institutions as free elections, free enterprise and workday coffee breaks.

Resource-wise, this Continent is still the richest land area on the globe despite the wanton waste and destruction of irreplaceable minerals it has suffer-

ed. It has a wide range of climates and soils capable of growing practically everything required for food, clothing and shelter. Its vast network of lakes and rivers, comprising most of the world's fresh water supply, can provide a Continental power grid adequate to supply vastly increased electrical needs. Extensive irrigation of arid but otherwise fertile regions could also be provided, as well as cross-Continent low energy cost, inland water transportation. In addition, it has a relatively low population largely comprised of people speaking the same language and having similar customs. This lavish physical environment at once gives North Americans a tremendous advantage over the rest of the world toward the realization of freedom.

The second ingredient is directly dependent upon the first; but without the addition of the second, the first ingredient would be unable to provide sustenance for more than a meagre population such as was living here when white men first discovered the Continent. Since the conversion of raw resources to use forms involves the expenditure of energy, it follows that that land area which is able to convert energy at the highest rate should have the greatest volume of consumer goods and potentially the largest measure of freedom. Here again North America leads the world, still having the highest per capita rate of energy conversion notwithstanding the enormous strides made in recent years by other areas.

Vast new reservoirs of energy conversion were availed by the invention of the steam engine which commenced the first significant substitution of non-human or extraneous energy for human energy. Until then human muscle power had been the main source of energy conversion, so irrespective of whether 'free' labor or slave labor was involved, there were tight limits on what the human engine could accomplish. Even 'freemen' had to work up to sixteen hours daily to earn their livings—not because of political laws obliging them to do so (though there were these, too), but because there simply was no other means of getting the necessary work done. The introduction of mechanical energy presented the first

means of foreseeable release from unremitting toil.

Such release was not an immediate product of the Industrial Revolution, either in Great Britain where it originated or in North America to which it was transplanted. During the years of rapid physical expansion following its introduction, the wage workers found it necessary to work harder than ever to meet the growing appetite of the lusty infant. Because the machines at first were sadly inadequate for the jobs for which they were designed, large human staffs had to be employed as gap-fillers for phases of their jobs the machines could not complete. Each subsequent improvement narrowed these gaps and emancipated more factory workers from repetitious and monotonous work.

North America's bountiful environment was particularly favorable to the application of the new productive techniques. Here, as in all pre-industrial land areas, the standard of living had been limited to what could be achieved by the conversion of human energy. This represented 98 percent of the total, the balance being represented by such non-human sources as domestic animals, windmills and water wheels. Then, in less than 150 years, the situation was completely reversed so that **human** energy now accounts for two percent or less of the total. Technology, powered by electricity and fossil fuels, converts at least 98 percent of today's converted energy. As a productive mechanism, **human** muscle power is virtually a thing of the past on this Continent.

Today, with automation, it is possible in some industrial operations for electronically-controlled equipment to carry out entire production programs without human assistance other than supervisory staff. For instance, some time ago the Columbia Record Company compared old and new processes in its Bridgeport, Connecticut, plant. Upstairs 250 men were producing phonograph records with hot and noisy hydraulic presses. Downstairs, four men operating almost noiseless machines were turning them out **eight times** as fast! Such modern equipment has become the great emancipator of human beings.

Modern technology has created a new environment for North

(Continued on Page 33)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

AUGUST, 1960 *Compiled by Editorial Staff* *No.* 177

Longest Belt Conveyer

THE LONGEST permanent cross-country belt conveyor system in the world was recently put in operation in southern Oklahoma. The series of seven conveyors, stretching for 5½ miles across the Oklahoma countryside, carries 1,000 tons an hour of either limestone or shale to Ideal Cement Company's new $20 million plant at Ada, Okla., from the company's quarry at Lawrence, Okla.

The conveyor system opens a new era for the Ideal plant. It provides a permanent transportation system that starts at the touch of a single push button and will operate effortlessly day after day, throughout the year, for years to come, with lower operating costs than any other form of transportation.

This sytem of belt conveyors, designed, built and erected by Link-Belt Company on a turnkey contract, has many unusual aspects:

One of the seven flights is the longest individual belt conveyor ever built. This belt conveyor measures 11,766 ft.—almost 2¼ miles.

Travelling at the rate of 500 ft. a minute, its 4½-mile belt makes only ten round trips in an eight-hour day.

This is the first major conveyor system ever supported by prestressed concrete structures. Light-weight concrete channels support the conveyor and provide a cover for the belt over the entire length.

The conveyor roadbed generally follows the terrain, with low places filled and high places crowned to give a smooth, rolling grade. In its cross-country course the system crosses two secondary highways, a main line of the Santa Fe. Provision is made at six points for passage of cattle and farm equipment over the system.

The entire system is on a right-of-way strip averaging 150 ft. in width, fenced on both sides. This right-of-way contains a 40-ft. earth roadbed with its drainage structures, an electrical power transmission line from mill to quarry, the belt conveyor structures and a 16-ft. stone-surfaced road.

PUSH-BUTTON SYSTEM

A single push button in the cement mill control room puts the entire 5½-mile system in operation. The belts are started automatically in sequence, beginning with the last belt. Each belt starts when the preceding one reaches approximately half speed, for minimum start-up time.

To unload the system, this cycle is reversed, with each successive belt stopping in progression toward the mill end. In the event of power failure or any stopping of the system while it is fully loaded, each belt in sequence has been engineered to coast for a successively longer distance, to prevent any pile-up of material at the transfers.

Numerous protective devices stop the system in an emergency and flash a signal to the operator in the control room. These include metal detectors, head and tail drift switches, belt slip switches and take-up overtravel switches. The motors have overload relays and under-voltage relays, and the eddy-current clutches have temperature relays. All safety devices show as lights on the control panel, and the system cannot operate unless all circuits are closed.

The conveyor system operates eight hours a day, five days a

week. It carries crushed limestone four days a week and shale on one day. The limestone is crushed to ¾-in. size in a crushing plant at the quarry end of the system. The shale is crushed to 6-in. size in the primary crusher, bypasses the screens and secondary crushers and proceeds directly over the conveyor system. Since it takes nearly an hour for material to travel the 5½ miles to the cement plant, the system is designed so that it can be stopped at night fully loaded.

At the cement plant, shale is deposited by stacker into a soaking basin, while limestone is carried into the plant by an inclined belt conveyor and distributed to one of six storage silos.

ECONOMIC ADVANTAGE OF BELT CONVEYORS

When Ideal Cement Company decided to build a plant with capacity of 9,000 barrels of cement a day alongside its 7,100-barrel-a-day existing plant at Ada, Okla., an economic study was made to determine the best method for transporting raw materials to the plant from the Lawrence quarry, which contained an estimated 90 years' supply of limestone and shale.

Principal considerations were reliability of service, low operating costs and reasonable capital investment and write-off period.

The company estimated that full production of both the existing plant and new plant, totalling 16,100 barrels of cement a day would require 5,000 tons of limestone and 1,375 tons of shale daily. Storage was set at 25,000 tons at the quarry, 22,000 tons at the existing plant and 14,400 tons at the new plant.

The study revealed that the belt conveyor would provide the most economical, reliable and efficient method of transportation. Though higher in first cost, it would prove less expensive over a period of years than any other type of haulage.

CROSS-COUNTRY JOURNEY

In order to take advantage of the most favorable terrain, the long-distance conveyor system was divided into seven flights, the shortest of which is 550 ft. long and the longest 11,766 ft. long. It changes direction six times. Grades average six per cent, with the steepest about 14 per cent.

All of the belts in the transport system are 36 in. wide and run at approximately 500 ft. a minute.

The takeups involved considerable ingenuity—arranging the sheaves, pulleys and sliding carriages to accommodate the belt elongation that occurs under various conditions of loading and starting.

CONCRETE STRUCTURES

In a radical departure from steel-supported conveyors, the belt conveyor system is supported by precast, prestressed concrete channel stringers spanning 50 ft. In addition to supporting the conveyor, the stringers form a cover over the belt. One side of the conveyor is curtained by a continuous corrugated aluminum wind guard.

The concrete channels are placed flange-down and supported by precast, concrete U-stands which are attached to field-poured concrete footings. Carrying and return idlers are suspended from the channels with galvanized steel hangers.

Where the conveyor is raised to clear highways or railroad tracks, the U-stands are mounted on the top flanges of pairs of prestressed concrete girders. The wide top flanges serve as walkways.

The girders follow as closely as possible the vertical curves of the belt. They are supported on poured-in-place bridge-type piers of reinforced concrete, varying in height and utilizing round concrete columns supported on reinforced concrete spread footings.

In the entire final conveyor, which is elevated to cross the main line of the Frisco railroad, the concrete stringers are carried on a series of 97-ft. post-tensioned, prestressed concrete girders which rest on four-legged concrete towers about 25 ft. high. These towers consist of four round columns braced by three layers of horizontal struts. Each tower rests on a single spread footing.

All structures were designed to withstand winds of 100 m.p.h.

—Line-Belt News.

Fingernail-size Genie

PITTSBURGH—A tiny, amazing new genie is coming alive in electronics.

It may bring you TV sets worn like a wrist watch, or even built into a pair of spectacles. It could fashion radios no bigger than a fingertip, or electronic 'brains' the size of a shoebox.

First it promises vital jobs in guiding missiles and satellites, in exploring space and in military communications.

Based on a new principle, this genie is molecular electronics.

One tiny sliver of material can do the work not only of vacuum tubes but other components such as rectifiers, resistors and condensers.

SIZE, WEIGHT SLASHED

This vastly slashes size and weight. There are no moving parts, nothing to wear out. Simplicity means more reliability, far less chance that something can go wrong electronically, for example, in a million-dollar satellite wheeling around the earth.

The secret is creating zones or domains of special types of molecules within one thin sliver or round dot of semi-conductors.

Each domain performs one job, and is separated from others by boundaries or interfaces within the material. Electronics can be made to follow orders.

Voltage or power is fed in, and controlled energy comes out. Only two wires or leads are soldered onto the chip of material, which may weigh as little as one one-hundredths of an ounce.

The Westinghouse Electric Corp. is a major pioneer in molecular electronics. For nearly a year its scientists have worked under a $2,000,000 Air Force grant to prove the feasibility of the new concept. Some other firms also are active in the new field.

Eight different types of molecular arrangements or tiny 'blocks' have been developed, S. W. Herwald, vice-president for research, reported. Westinghouse scientists also have developed ingenious

methods of growing the material and arranging the 'desired families' of molecules.

The break with tradition is not to think of customary circuits with many components and trying to miniaturize them, Herwald explained.

ONE LITTLE BLOB

Instead, as many functions as possible are put in one little blob of material by engineering the right domains of molecules.

This approach came from fundamental and applied research in solid-state physics and semiconductors, such as germanium and silicon, and other atoms which confer special characteristics.

Such research earlier led to transistors, which mainly replace vacuum tubes. In some molecular-electronics devices, one domain can do the work of the transistor, and other domains do other tasks.

Yet the whole thing is unbelievably tiny, an eighth of an inch wide, a quarter inch long, and only three times thicker than this magazine page.

PRECISE AMOUNTS ADDED

Crystals of germanium and silicon contain millions of electrons, wandering about in random fashion, Herwald explained. But scientists are learning how to make them do special work by adding precise amounts of molecules of gallium, boron, phosphorus, arsenic and other elements at certain spots or even to certain depths.

These molecules are placed in the germanium-silicon block by various tchniques, including etching, photographic imprinting, or formation of special alloys.

So far, the little devices largely have been hand-tooled, but new research promises to make production nearly automatic.

In one prime step, the crystals of germanium and silicon now can be drawn from a furnace in a continuous, mirror-shiny ribbon or strip an eighth of an inch wide, and a few thousandths of an inch thick.

CORRECT ALIGNMENT

This is the basic material, its crystal structure aligned in the desired way.

The starting materials are kept molten in a small furnace. Then a small seed of the desired crystal is introduced, and rapidly pulled out, resulting in a ribbon drawn out as fast as 17 inches a minute.

The seeding compels the formation of crystals just like the original seed, in a process strikingly like the reproduction of living gene, R. L. Longini explained.

Some basic ideas for these processes were contributed by Clarence Zener, director of research, from studies of what happens when metals are supercooled and freeze, and how seeding works.

—Associated Press.

Coal Stripper Deluxe

WORLD'S largest mobile land machine is under construction now to make previously unreachable coal reserves available.

Bucyrus-Erie Company is building a stripping shovel more than twice the size of any such machine now in operation for Peabody Coal Company's new mine in western Kentucky.

Weighing 14,000,000 pounds, or more than one of the Navy's new Juneau-class cruisers, the 3850-B, as it is called, will be a machine of staggering size and capabilities.

Its boom will tower 210 feet in the air, about as tall as a 20-storey building, and as high as the deck of the Golden Gate Bridge, or 56 feet higher than the Statue of Liberty, or 45 feet higher than Niagara Falls.

THREE-CARLOAD BITE

In 50 seconds its 115-cubic-yard bucket will scoop up 173 tons of material, as much as three railroad hopper carloads, dump it 464 feet away, and swing back for the next bite. The 3850-B will require 12,000 horsepower to operate. Fifty-two electric motors, ranging from ¼ to 3,000 horsepower each, will operate and propel the huge shovel.

The entire machine will be supported by four hydraulic cylinders at each of the crawler tracks. These are designed to keep the machine

in a level position at all times, and will require 4,000 gallons of hydraulic fluid.

As large as it is, however, the giant machine will be controlled by a single operator from an air-conditioned cab five storeys above the ground. A passenger elevator will carry him to his perch. Entire operation of the machine will be accomplished by two hand levers and two foot pedals.

TWO YEARS TO BUILD

Once in operation, the 3850-B will daily uncover twice its weight in coal, enough to heat 7,500 average homes for one month. Bucyrus-Erie expects it will take two years to build the shovel, and erection will take six or seven months at the mine site. Parts will be shipped there in more than 250 railroad cars.

Constructing a machine of this sort was compared to shipbuilding or military projects by Bucyrus-Erie. In order to move this super-size shovel, the manufacturing firm explained, it 'must be completely disassembled into pieces that will fit on a railroad car. . . . Some have been moved as much as 10 miles without disassembly, but such moves are as costly and complicated as complete teardown.

'This particular shovel will be used at a new mine we are to install in western Kentucky to fill a contract we have made with Tennessee Valley Authority for the delivery of a total of 65,000,000 tons of coal at the rate of 4,000,000 tons annually,' Peabody said.

'The machine will not change general stripping procedures but will simply call for all these steps on a larger scale,' according to Peabody. This means that 'instead of the 50-ton trucks we usually operate to haul coal from the pit, the trucks will probably be larger than 100 tons each. Likewise the drilling machines which drill holes for shooting the overburden before stripping operations will be of much larger capacity,' the coal company said.

Officials of both companies regard the 3850-B project as a significant advancement in coal mining operations. Reserves which previously would have had to be mined by costly underground methods can be mined now by the lower cost strip mining method.

—Kenneth Hufford in Christian Science Monitor.

Radar Burglar Alarm

RADAR, which has won its police spurs trapping speeding motorists, is gaining new laurels trapping burglars and safecrackers.

The new electronic watchman is called radar-eye.

It is a 50-pound box, little bigger than a mantel radio, which fills any room or area up to 50 feet in diameter with microwaves.

Four antennas can be hooked to the same box to cover four different areas in the same building or plant.

ALL ANGLES

It is impossible to enter the protected area from any angle (roof, cellar, door, walls or windows) without disturbing the waves and setting off an alarm.

Radar-eye can be tuned so sensitively that a simple flick of the finger through the empty space in a room will touch off the alarm.

Or it can be set so that an initial movement (such as cans accidentally toppling from a shelf) won't disturb it, but any second movement will.

CUTTING REVEALED

Burglars can't disconnect it because the alarm sounds if its plug is pulled out or the wires leading from it are cut or the current is interrupted for any reason.

It can be turned on and off only by key in a remote control box. If this box is tampered with the alarm goes off.

Radar-eye is in wide use in the United States. It guards key government installations, such as those of the Central Intelligence Agency, Atomic Energy Commission and treasury department.

R. A. Conlin, president of Automatic Controls Installations, Vancouver, agents here for the U.S.-built device, says so far he has placed about 40 radar-eyes throughout British Columbia. They have been installed in warehouses, stores, business firms and an art gallery.

—Tom Ardies in The Vancouver Sun.

Through the Technoscope...

Technocracy examines the various scientific and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

Science and Technology

PRODUCTION SYSTEMS, INC., A new Seattle company, has demonstrated how the lumber industry can automate one of the last sawmill operations still done manually: sorting lumber.

Sorting by hand is a tough job that requires 5 to 10 men per shift in a medium-sized mill, perhaps 30 to 40 in a large one. Production Systems says most mills would much prefer to transfer this manpower to less back-breaking work, where it might be used more efficiently.

The new unit, which does all the hard labor sorting, needs only one attendant to run it. It segregates lumber according to length, width, and thickness entirely automatically. A chain conveyor feeds random pieces of lumber into the sorter. As they come through, flexible wire fingers 'feel' the boards and transmit their measurements in the form of electrical impulses to magnetic steel disk. A proximity switch scans the disk and actuates circuits controlling solenoid-operated air valves, which open and close gates that let the boards pass into a series of trays. By the time a particular board reaches the gates, the one corresponding to its classification opens.

It still takes a human eye to distinguish grades and species of lumber; this is the attendant's task. As he judges the kinds of boards, he pushes buttons on a console that also sends pulses to the magnetic disk—and from that point, sorting by grade proceeds in the same way as sorting by size.

A TAPE-READING DEVICE ATtached to your telephone permits you to make a call merely by pushing a single button. The tape contains up to 850 printed names and punched numbers. To call, you rotate the desired name into a viewing window, lift the phone receiver, and press the starter button. Numbers can be changed or added with a built-in punch. The device, manufactured by Dialaphone Corp., San Mateo, Calif., is installed and serviced by your local telephone company.

TWO NEW MECHANICAL MIDdlemen soon will be serving up food and entertainment at the drop of a coin.

One of the new automatic vending machines, a food dispenser, is already on the market. It is virtually a restaurant in a cage. Its 130 refrigerated compartments hold sandwiches, salads, pies, cold desserts, fresh fruit, fruit juices, carbonated drinks, and milk. An unusual feature, according to its maker,

Rowe Mfg. Co., is that the customer buys the same item he selects. The contents of all 130 compartments are displayed 52 at a time by pushing a button that revolves the shelves on a chain belt. The customer works the item he wants into place behind one of a number of glass windows that can be opened after coins are deposited.

The other new vending machine dispenses phonograph records. Intended for installation mostly in drug stores and movie theatre, the dispenser is now in production at the Manhattan-Beach (Calif.) plant of U.S. Chemical Milling Corp.

A STAIR-CLIMBING HAND TRUCK driven by an electric motor moves heavy loads, such as appliances and pianos, up and down stairs on two rubber belt tracks. The operator has only to guide and balance the load. Run from a household outlet, the truck is said to ascend and descend with a 500-lb. load at 18 feet per minute. Automatic braking prevents it from moving when the power is off.The truck is made by New Design & Development Corp., Lima Ohio. General Electric Co. provides the motor.

A NEW AID FOR WAREHOUSE personnel working in congested areas has been produced by Automatic Trans" portation Company, Chicago, Ill. It is a 'walkie' Skylift mast which allows one truck to lift materials a height of 12 ft., thus automatically making it possible to increase warehouse capacity as much as a third. The Transporter cantilever-type stackers are available in 1000 through 4000 pound capacities.

A NEW KIND OF SPARE TIRE soon to be on the market is the Dunlop Tire & Rubber Corp.'s answer to the automobile owner's plea for more trunk space. Resembling a flat tray, it consists of a deflated tubeless tire, less than an inch thick, mounted on a thin steel disk instead of a conventional wheel. The disk is drilled to match the wheel studs of the car. When he gets a flat, the driver inflates the new spare with a carbon dioxide bottle and bolts it on in the usual way. It will cost considerably less than a conventional spare, says Dunlop.

DX100L IS A HAMMER-OPERATED tool for direct fastening into concrete, brick or steel. It operates with or without a cartridge and is strictly a hand-tool and not a gun. Instead of the threaded pin or stud being fired like a bullet into the surface, the DX100L method utilizes a front plunger which cannot leave the tool. This system allows the fastening to be guided accurately to the exact degree of penetration required and in complete safety. Although this cartridge strength is only half that of the gun-tool cartridge, it is said a pull of 2000 lbs. average is needed to extract the studs or pins.

EVERY FUNCTIONAL DETAIL OF an airplane in flight capable of being rendered in the form of an electrical signal can now be recorded by a new electronic device. The electronic recorder, developed by Royston Instruments

Ltd., Byfleet, England, records the particulars on magnetic tape while the flight is in progress. Six recording channels, used consecutively, indicate what is happening in various parts of the craft.

The technological story of the trip thus taped can be subsequently played back. It represents the behaviour of each engine, the performance of the propellers, airspeed, cabin pressure, flap setting, rate of fuel flow and scores of such points as might be useful to know if something went wrong or would help to diagnose trouble if the pilot should put in a complaint. The instrument is about the size of a small radio receiver and weighs 40 pounds.

A WATER-BASED COATING RESIN for paper is easier and cheaper to apply than other coatings that provide water and vapor barriers, claims National Starch & Chemical Corp. The coating resin, a specially compounded plastic called polyvinylidene chloride, is three to four times as effective as polyethylene film in barring vapor.

The resin is chemically inert and has met U.S. Dept. of Agriculture standards for use in contact with meats. National Starch believes it will be useful as paper coating for bleached board in food packaging, as a waterproof inert coating for milk cartons, and for other packaging applications such as potato chip boxes, bread wrap, and corrugated cartons that need water and grease resistance. The material is resistant enough to grease and oil for use in a paperboard container for automotive lubricating oils.

PARKING LOT ATTENDANTS ARE speeding up their operations with the help of a pocket-size two-way radio called the Pocketphone, manufactured by Globe Electronics, an Iowa division of Textron Electronics, Inc.—itself an affiliate of Textron, Inc.

Said to be the smallest on the market, the transistorized device — about the size of the miniature transistor radios that have been around for a couple of years— contains a complete transmitter and receiver, with built-in microphone and speaker, retractable whip antenna, and a plug for earphones. Using a pair of these, conversations at distances up to a mile can be carried on, according to the company. The Pocketphone is powered by a 9-volt, rechargeable nickel-cadmium battery which is said to have a life expectancy of nearly a year of eight-hour-a-day operation.

★ ST. JOHN'S, NEWFOUNDLAND—Pepperrell air force base, a mainstay in the economy of St. John's, will be closed this summer, the U.S. Air Force and RCAF have announced. Headquarters at the site, a half-mile from here, will be disbanded effective August 1st, 1960, and the base will be reduced to caretaker status by September.

The base has about 1,150 employees in this area, earning $4 million annually. Premier Joseph Smallwood said the closing would be a severe economic blow.

—*Canadian Press.*

(Continued from Page 20)

Americans by making them the first people in history to be able to have an abundance of all physical goods. This has not been the result of foresight and imagination on the part of our business leaders. They have merely been more fortunate than their equally predatory counterparts in other land areas which have lacked the resources to support the array of technology which has been developed here.

Let there be no delusions about the part business has played in developing that technology, even after conceding that it has provided much of the impetus for such development. Whatever business has done it did only to serve the purpose of building a financial empire, and anything that would serve that purpose better than previous methods has simply been good business. Technology has proved the most effective means of cutting costs and increasing production, so was naturally developed and installed as fast as was economically expedient. Business deserves no bouquets for such development, however, for in fulfilling its Price System objectives it has been criminally wasteful of the Continent's resources. It has assumed some freedoms of its own, such as the manufacture of intentionally shoddy products and the design of consumer goods with built-in obsolescence.

But how it came about is not nearly as important as our now having a technological mechanism that can convert raw materials into consumer goods with very little human effort. Our combination of natural resources and installed technology has been able for over thirty years to provide physical abundance to all North Americans and to reduce many restraints on human activity that could not earlier have been reduced. Are we then free? Can we really come and go as we please and do all the things we wish to do?

It should be obvious that not all forms of restraint can be eliminated. Individuals cannot be permitted to go around assaulting other people, for instance, or to engage in other forms of violent anti-social behaviour. We are part of the physical world, so must always be more or less subject to environmental restraints. These include the responsibilities

imposed upon us as members of society, irrespective of its governmental form, to keep the essential operations for human survival operating.

Notwithstanding these inescapable restraints it is still possible to have a considerable measure of individual freedom in land areas possessing the favourable combination of ingredients mentioned earlier. We have seen that in regard to the first two, North America is especially well equipped, so the battle is already two-thirds won. How do we rate on the third one concerning the adequacy of distribution?

Unfortunately, our social mechanism today falls down badly on the problem of moving the plethora of consumer goods from points of production to the consumers. Our obsolete Price System has become progressively less able to move the goods as our technology has become more efficient in producing them. Even in conditions of natural scarcity the Price System was not too satisfactory, being as it was an exchange rather than a distributive system. It was intended to sell a scarcity rather than to distribute an abundance — and never actually faced the latter necessity until after World War I. During that conflict, the sudden extra transfusion of extraneous energy conversion into our technological mechanism hastened the significant meeting between two graphic lines representing the decline in manhours per unit of production and the rising production rate. This occurence has resulted in an increasing, irreconcilable disparity between consuming power and mounting inventories, and has imposed numerous restraints upon North Americans which would not exist except for the stubborn retention of the Price System.

As technological disemployment progressed, labor reacted in a manner which would seem strange if considered from any other than a Price System point of view. Instead of greeting technology as the long-sought release from unremitting toil, the men of the labor unions have denounced it as an infringement of their dubious 'freedom to work.' Since in the Price System their livelihoods have depended upon how many manhours they could sell and upon how much they got paid therefor,

they have tended to look upon the encroachments of technology with hostility as a threat to their freedom. This is rather ironic, for as a measure of protection against technological encroachments, the unions have had restrictive clauses written into their contracts.

These clauses have had the effect of dividing labor into a number of competing factions engaged in jurisdictional disputes to determine who may or may not perform certain types of work. Carpenters, for instance, may in some cases be perfectly capable of doing the masonry in a building, but they are not permitted to do so because it would infringe upon the functional jurisdiction of the masons. Similar restrictions are imposed in most other industries, the lines being more tightly drawn as they become more technologized. Whatever their reason for being, these restrictions which often reach complete functional absurdity constitute restraints on human activity.

One of our proudest boasts declares our vaunted 'freedom of the press.'

This may be so in law, but in actual practice a somewhat different situation exists. Newspapers and other periodical publications seldom will print articles that might antagonize a significant number of their advertisers, for they depend upon those advertisers for their existence far more than upon their readers. As a result, even straight news stories frequently suffer distortion, while controversial issues are treated with an editorial circumspection which increases with the social significance of the matters involved. Sometimes continuing articles have been printed because of their wide reader appeal and consequent sales attraction, but have later been discontinued because of advertiser opposition. This was the treatment given Technocracy which was proclaimed across the Continent in 1933 in banner headlines that many readers will remember. Then, as suddenly as it started, the publicity ceased. The Organization had made it known in no uncertain terms that it would not sell North Americans down the river as had so many of its contemporaries. Technocracy could not be bought out to serve the purposes of Price

System business. When this was learned, the lid of publicity was securely clamped on the work of Technocracy Inc., and has not since been lifted. Far from finding itself free to publish material of serious social significance, the Price System press had found it extremely expensive in the form of threatened withdrawals of sustaining advertisements.

The same economic pressure has been exerted in opposition to free speech. Despite constitutional guarantees of free speech, few people will speak out loudly and constantly against something highly approved by their employers. If they are free to speak as they wish, their bosses are also free to fire them for so expressing themselves. Since their livelihoods depend upon maintaining good relationships with their employers, few employees will be so imprudent as to take vocal stands on matters that might antagonize those employers.

It will be argued that if they don't like or agree with their employers, they are free to quit and seek employment elsewhere. Theoretically, this is so, but there is generally little tendency to take the risks involved, especially in the more highly competitive fields where there are many more trained persons than there are jobs to go around. Once again, purely economic factors restrain the dissatisfied employees from making very much desired moves. Those with longer years of service become progressively less inclined to change jobs as their seniority, pension, vacation and certain other benefits increase. Heavy personal debt is another powerful deterrent.

The degree of education a person has is a major determinant on the type of job he can hold. Young people find themselves limited in this respect more by the size of their parents' incomes than by their own intellectual capacities. Only in exceptional cases can they overcome such economic obstructions and win on their own academic merits the scholarships to further their education. If they are sufficiently outstanding, they might even attract potential employers who will finance their specialized training on the understanding that they will afterward be hired. Most youth, however, are not in that category. They have apti-

tudes and reasonable ability in individual directions, but unless their parents can finance their higher learning they simply don't get it. They must settle for something less, and consequently for the limited opportunities availed by such lesser education. Their entire future life is therefore determined by how much education their parents can finance, or by how much they themselves can earn on between-terms jobs. Not only their own lives but the welfare of the entire society is modified by the extent to which their inherent abilities are economically enhanced or sabotaged.

There are numerous other restraints which are so taken for granted today that they are either not recognized as restraints or else are considered unavoidable. Within a Price System economy many of them **are** unavoidable, but where only financial problems are involved most could be eliminated. There need be no opposition to technology, no restraints on the printed or spoken word, no limitations on education other than the ability to learn, except for the frantic gyrations of a haphazard monetary economy trying futilely to adjust to physical abundance. The Price System has proved completely incapable of providing the third basic ingredient of freedom, namely, a distributive mechanism that can move what is produced to waiting consumers with a minimum of obstruction, delay or human effort.

Technocracy Inc. has had the blueprints ready for such a mechanism for nearly three decades. For that length of time, but for human apathy, North Americans could have been enjoying **all** the benefits of their bountiful land area and productive technology, rather than only those that have managed to squeeze past the monetary obstruction. They would have seen their consuming power steadily increasing and their required functional service time decreasing as their standard of living improved far beyond today's Continental average.

The social blueprint of Technocracy necessitates a realignment of North America's physical equipment to increase efficiency and decrease waste. Because human muscle power is both inefficient and wasteful, a major emphasis would be placed on removing it as fast as possible

from productive and distributive functions. With an optimum amount of electronically-controlled automation operating around the clock and throughout the year, it would soon be possible to operate all facilities with a maximum individual service requirement of only sixteen hours weekly with shifts normally being four hours per day for functionals between ages 25 and 45 years. It is easy to see that with so much free time at their disposal—not just during the week but for 78 continuous vacation days each year—and with their plenteous consuming power to obtain things they need and desire there would be virtually no restrictions to real enjoyment of life compared with what exist today for most people. This, incidentally, is **not** the promise of Technocracy Inc., but of the land area of North America if **all three** basic ingredients of freedom are effectively combined. Technocracy has merely supplied the means whereby this can be accomplished, and has assumed the task of informing North Americans about it. They have rejected it so far, but the pressures of abundance against an economy of scarcity are mounting so ominously that it is probable that individual security problems will finally o b l i g e them to give the blueprint serious consideration. If not, the people of this Continent might well be the first in history to have freedom thrust upon them whether they want it or not. Until now, acceptance or rejection of Technocracy's blueprint for scientific social governance without a price tag has been a take-it-or-leave-it choice; but the march of current events on both the global and domestic scenes has been so rapid and seriously detrimental to the Price System that the choice is narrowing to a matter of decision between extinction and survival. Retention of the Price System marks the road to extinction while scientific governance leads to survival and a high order of freedom. It remains to be seen which road North Americans will follow.

There are other restraints in existence which seem not to fall neatly into the category of Price System limitations, though some do to greater or lesser extent. Negroes, for example, are restricted for no other reason than

their race from performing certain types of jobs, from living where they wish or from joining white people's organizations. The same discrimination is exercised against Jews and other races and nationalities. Religions of various types impose their own particular restraints on their followers. Most large firms have a list of organizations that are favored or unfavored for membership by their employees, and promotions largely depend on obedience to the firms' implied wishes. There are restrictions on the type of clothing that are acceptable in different places and at different times of day. A man may wear bathing trunks at the beach, for instance, without attracting attention; but if he wore them that evening at a formal ball where he was expected to wear a tuxedo, he would probably be ejected forthwith. By the same token, if he wore a tuxedo at the beach he would be considered queer. The reader can add his own further instances of restraints. Some may be quite serious — others, insignificant and amusing, but they constitute limitations that are both unnecessary and avoidable. Not all can be immediately eliminated with the demise of the Price System, but the removal of its monetary interferences will vastly simplify the problem of removing or reducing those limitations.

We have the land area and the high energy conversion mechanism for producing an abundance of goods with minimum human effort. All that remains to be done is for North Americans to prove that they have that freedom of thought which they have long professed. They have their best possible means of proving it by investigating and supporting North America's only social dynamic — the Organization of Technocracy Incorporated whose scientific social blueprint provides that distributive mechanism which is the third basic ingredient to freedom.

—Rupert N. Urquhart.

★ TORONTO—Canadian motor vehicle registrations in 1959 totalled 5,011,506, including 3,795,194 cars and 1,120,631 trucks, says the Canadian Automobile Chamber of Commerce. During 1959 the 5,828,855 Canadians who have drivers' permits drove 41,000,000,000 miles and used 3,400,000,000 gallons of gasoline.

There was a vehicle for every 3.5 persons and a passenger car for every 4.7 persons compared with a vehicle for every 7.6 persons and a car for every ten persons in 1946. *—Canadian Press*

For Sale -- Junk!

Cars and other products once were advertised for their durability and other desirable features. Writing in THE PROGRESSIVE, the author, a New York advertising consultant, explains why durability spells economic suicide in an economy of abundance.

THUMBING through back issues of the Saturday Evening Post for 1933, one is struck by the repetition of a single selling theme in almost every advertisement — the durability of the product. Cars were inexpensive, economical to operate and maintain, and long-lasting. Packard sold the 'toughest, longest-lived cars built in America today.' Chevrolet sold solid construction, modest gas and oil consumption, and suggested that 'the money you save on a car like this . . . is enough to buy several nice accessories, or make a monthly payment or two.' Buick hailed all the Buicks on the road that had traveled 200,000 miles and more, and were still serving a useful life after 'five, ten, even fifteen years of use.' Nor was it only automobiles which were sold on durability. So were refrigerators, radios, furniture, clothing, shoes, clocks, irons, carpets, and paints. All promised faithful, long-lasting performance.

Today, we are in another merchandising world. In less than two decades, in the changeover from an economy of scarcity to an economy of abundance, product integrity had tragically fallen victim. Today, millions of dollars are spent on promoting 'the square-look' in kitchen appliances, wafer-thin watches, free-form furniture, sculptured-look irons, wrap-around chrome on cars. But manufacturers are silent on the durability of their wares.

They are silent for good reason. Product durability in an economy of abundance is nothing less than economic suicide. No one knows this better than manufacturers. They view with both pleasure and anxiety the mad scramble by today's consumers to accumulate household and personal goods. Major appliances, such as refrigerators,

radios, television sets, washers, and dryers, whose life cycles extend to ten or twelve years, already have saturated nearly all the nation's households, and other consumer goods are approaching saturation. The widespread application of automation, enabling factory production of consumer goods even more easily to outrace consumption, increases the problem.

Many industries, particularly in the major appliance field, face steadily shrinking markets and individual manufacturers ultimate extinction. Industrial officials have felt they simply had to shorten the useful life cycle of so-called 'durable' consumer goods to hasten the return of the consumer to the market. In recent years, many have adopted the venerable Detroit practice of the Annual Model Change.

Frigidaire broke with twenty-five years of uninterrupted production of 'streamlined' white appliances when it offered new 'Sheer Look' styling in color-tints. 'Every line is straight, every corner is square, the whole look is sheer.' Consumers were enticed by charcoal gray, Mayfair pink, Stratford yellow, Sherwood green. A study had indicated that color loosened the purse strings, particularly in the mushrooming middle-income class, where the extra money lies today. Color promised quicker obsolescence of the ninety-five million refrigerators, ranges, and washers sold in the last ten years. Four out of every five buyers of the new tinted refrigerators admitted that the refrigerators at home were still in good condition; one out of three said the appliance was less than five years old. 'It is my belief,' remarked a company executive, 'that color . . . will enable us to reduce significantly the trade-in span from eleven years to perhaps seven, or even lower.' Another executive told the American Marketing Association that creating psychological obsolescence was absolutely essential to industries selling in saturated markets. He hoped the appliance industry would be 'as successful as the automobile people.'

The watch industry, which had been plagued by the durability of its products — 'watches just won't wear out' — opened a drive to change the public's mind about the desirability of old watches.

'A man will wear the latest in shirt fabrics, the short brim hat, new striped tie, Dacron shirt, but he will take pride in showing a watch that's twenty years old and looks it.' Benrus, Bulova, and Gruen turned to style obsolescence as the psychological lever to raise annual watch sales from twelve million to a more profitable twenty million. Ten or twenty dollars was offered for old watches 'regardless of age, condition or make.' Thousands of watches were purchased and junked by the companies, which called the promotion 'spectacularly successful in obsoleting old watches.' Not only was the public reeducated that a watch was not a lifetime purchase, but fashionable people bought a 'wardrobe' of watches for various social functions.

The furntiure industry jogged consumers to replace ten- and twenty-year-old living room and bedroom suites. National Furniture Review, a trade publication, told retailers how to pry loose the extra cash of the middle-income class, which is particularly susceptible as a group to the blandishments of 'new, modern furniture,' citing examples of successful advertising approaches. A Uniontown, Pennsylvania, store offered '$50 for your old living room or bedroom suite regardless of age or condition.' A San Francisco store urged consumers to 'Trade-In and Spruce-Up.' A New York City furniture chain told consumers: 'Trade in your old furniture as you would your old car.' Trade-ins were reported by retailers throughout the nation as a sales booster of expensive new furnishing. Four out of five retailers today gladly accept old furniture as trade-ins. 'Only eleven per cent report the handling and resale of trade-ins as profitable,' but the practice 'magically facilitates the sale of new goods.'

The Carpet Institute urged the trade-in practice on carpet retailers. As a proven inducement to consumers to 'replace rugs and carpets earlier and more often,' it opened up the big, new 'carpet replacement market that awaited exploitation in this country.' Recommended consumer advertising approaches were: 'Don't Be Chained To Your Old Rugs,' showing a pretty young thing handcuffed to a rug; 'Unhappy With Your Rugs and Car-

pets?' asked of a brow-furrowed housewife; and the painless cure for anybody's 'homitosis,' another way of tagging old-fashioned styles. The replacement sales campaign succeeded: retailers reported a twenty per cent rise in new carpet sales, and the problem of inducing consumers to replace rugs less than ten years old seemed solved. Previously, consumers had allowed fifteen years and longer between carpet purchases. Now, retailers automatically picked up an extra bonus, because the old rug is prevented by the trade-in practice from landing on the floor of a secondary room, thus keeping the channel clear for an additional carpet sale.

At a recent marketing conference of the National Association of Home Builders, 1,000 of the nation's biggest builders were urged to embrace the trade-in principles developed by the automobile industry. 'How many new cars would Detroit sell if Ford, Chrysler, and General Motors spent all their advertising dollars telling motorists how easy it is to fix up a 1950 car to be just as good as a new one? The builders were told they were inadvisedly 'spending four dollars advertising to the fix-up market for every one dollar spent to tell customers how much . . . more fun it is to live in a fine new house than in the present old one.' Today, one out of three builders pushes new home sales by inducing the buyer to trade in his old home. If the trade-in advice is fully heeded, 'tomorrow may find trading homes as common as trading cars and appliances is now,' editorialized the American Builder. A Dallas builder skyrocketed his annual sales from $250,000 to $2,250,000 in three years by persuading buyers to swap modest for more luxurious homes. And recently, the National Institute of Real Estate Brokers noted the passing from the American scene of something held dear by every prior generation: the goal of owning a home without a mortgage.

Detroit's automobile industry is today the mecca for many other industries, each seeking salvation and redemption by shortening the useful life of its products. Electric shaver companies offer up to $8.50 as a trade-in allowance toward the purchase of a new shaver. RCA Victor gives

a one dollar credit for each old record toward the purchase of new records. Singer offers a $50 allowance toward a new sewing machine. Big photographic supply houses agree: 'Trade-in allowances are lifeblood of our sales.' Johnson Motors acknowledges that half its outboard motor sales are trade-ins. Even the sterling silver industry, an ancient symbol of wealth and aristocracy, has succumbed to the trade-in practice.

If the trade-in is one side of the coin, the other is shoddier goods; together they form a syndrome characteristic of our times, in which, ironically, the continuance of product durability would threaten the nation's prosperity. Trade-in is partly justified by the psychological satisfactions it gives to owners of the up-to-date. But shoddy goods only produce irritations, vented in angry letters to manufactureres, retailers, newspapers and magazines, and particularly women's service publications. Directed mostly at automobiles and electrical appliances, resentment runs high at glaring examples of slovenly workmanship, poor materials, careless assembly and inspection. 'The American motoring public,' Automotive News has warned, 'will not put up with the missing bolts and nuts, the malfunctioning parts, the squeaks and rattles and frequent return trips to dealers for adjustments—all of which are the rule and not the exception in present American cars.' What new car owner in recent years has not replaced a blown-out muffler several times? Today, the muffler is the product of a $300 million industry; a few few years ago it was just another automotive part.

Probably the most frequent visitor to the American home today is the serviceman for the washer, dryer, TV, and other electrical appliances. A Chicago housewife told Printer's Ink, a sales publication: 'I always have a "man" coming. One came yesterday, one came today, there'll be one tomorrow. It almost seems as if the repairman is a member of the family.' A target himself for consumer anger, the repairman is quick to point out the loose wires, poor insulation, faulty filters, and other defects. One repairman said: 'Things are made too fast now. In the last three or four years appliances

are even worse than they were after the war.'

An especially striking example —an open secret in the appliance industry—is the washer and washer-dryer turned out by a major company between 1955 and 1957. A field check disclosed an inordinately high number of service calls, two or three times more than the number expected. A published report stated: 'Thousands of housewives complained bitterly that their 1955-57 washers and washer-dryers needed six or seven annoying and costly repair calls a year . . . Company repairmen discovered faulty clutches, transmissions and filters in alarming numbers.' The company is making good, repairing and replacing some 40,000 units at an estimated cost of $10 million. But totally unexplained is how thousands of defective appliances were turned out for three solid years without detection. Where was the company's inspection staff? What is the point in the company's spending millions of advertising dollars building up its image in the public mind as a producer of reliable goods, and then losing every nickel in the bitter consumer cry: 'I'll never buy that brand again!' This company, like other blue chip companies, would not tolerate the installation and use of plant equipment that was faulty. Why should the consumer, any more than the manufacturer, tolerate second-class equipment?

Repairs are becoming more and more costly to consumers. The average family spends an estimated $100 to $150 annually to restore appliances to working order. Part of the cost, of course, results from the growing number of appliances in the home: today's housewife operates perhaps $2,000 worth of equipment. But part is the direct result of built-in infirmities in products. Many 'can scarcely hold together for shipment,' E. F. Tangerman noted in Product Engineering. It denotes what one adman calls the 'what-do-you-expect' attitude by manufacturers; another more inelegantly calls it 'the great goof-off.' Recently, Representative Leonor K. Sullivan, Missouri Democrat, suggested that so many U.S. manufacturers are cutting so many corners to keep costs down that 'shoddy' may eventually become the national norm. She sympathized with the

millions who find their new gadgets of all kinds falling apart in use.' And Advertising Age gently reminded manufacturers that 'consumer respect for the product is an essential part of any marketing mix.'

Today, industrial engineers and designers are hired by the thousands to perform annual face-liftings on consumer products. They do the job, but most of them resent it bitterly. Their years of training equip them to make useful consumer products still more useful. But their training is wasted, and the textbook precept that good design must be built in, not draped on, is violated in their daily work.

Annual restyling of cars, appliances, radios, carpets, watches, TV's, furniture, and thousands of other items tends to debase American taste. 'There are only so many good ways at a given time of designing a product,' says Walter D. Teague, Sr. 'If you must do something different, you are apt to do something bad, something bizarre. That is why car design has grown so extreme in this country. People buy these flamboyant jobs because nothing in better taste is offered.'

Still more serious is the debasement of a key mass production principle, by which standardized products are produced in quantity at low cost. This consumer benefit is being lost as more and more manufacturers push multi-million dollar trade-in programs. Says Harold Van Doren in Industrial Design, 'The cost of continuous restyling, not because of design fees, but because of tool expense and constant revision of merchandising and promotional plans, tends to cancel out the advantages of mass production by keeping prices artificially high.'

Clearly, the nation as a whole is suffering an irreparable loss in the process of speeding up consumer goods consumption. How meaningful is the achievement of a $500 billion Gross National Product when so much of it represents goods that are junked yearly or so poorly put together that they fall apart quickly in use? As manufacturers continue to shorten the useful life of their products, and Madison Avenue mounts an $11 billion annual advertising barrage to sell consumers on the middle-class ethos that ownership of the up-to-date

is prima facie proof of superior status, it is time for a reassessment of individual and national objectives. The recently established President's Commission on National Goals would do well to look into this disturbing development of planned obsolescence as it searches for ways to chart more hopeful roads for America.

—Joseph J. Seldin.

★ FORTY B.C. FIRMS went out of business in the first quarter of this year. This is twice the total of business failures in the province during the first three months of 1959. In March alone there were 13 business failures here compared with seven a year ago.

Number of failures was revealed in a survey carried out by Dun and Bradstreet of Canada Ltd. It showed a rising trend throughout the country. During the first quarter some 499 firms folded, an increase of 170 over the same period last year.

Construction and service industries account for most of the increases in failures in February and March, both locally and nationally. Manufacturing industry failures climbed over 70% above the previous March. The toll among wholesalers was up 7% and among retailers 17%. Geographically, most failures were centred in Quebec and Ontario. New Brunswick competed with B.C. in leading other parts of the country.

Climb in business failures was sharpest in non-metropolitan districts. Nationally, dollar liabilities in March totalled $13.9 million. More concerns succumbed in all size groups, but the most noticeable increases occurred among business capitalized at under $5,000, and in medium-size ones capitalized in the $2,000 to $100,000 range, the survey showed. *—Vancouver Sun*

★ HARTFORD, CONN.—Dr. Brock Chisholm said Friday night the human race can no longer survive as a number of groups in ruthless competition with one another. The former World Health Organization chief said we will survive as the human race or very few people will survive at all.

He told the Hartford chapter of the United World Federalists: 'This is the first generation that has ever held a veto power over continuing human evolution.' Neither governments nor international institutions can cope with the world's major problem, alone, he said. A growing responsibility and maturity among individuals was needed.

Few people had come to grips with the fact that by the end of the 20th Century the world might have twice its present population. *—Canadian Press*

★ TORONTO—School children may get their education from machines before long, with teachers likely to become tutors, according to Dr. William D. Sheldon of the University of Syracuse, Syracuse, N.Y. Speaking to the Ontario Educational Association, he predicted that 'because of the advances in television and radio, the advent of teaching machines and the rapid growth of population, schools can no longer be content to operate as they have in the past.

We need to plan now for the classroom of tomorrow. Some day it will be a class dominated by television and radio, and it is felt that teachers will become tutors and that efficient learning will be implemented by teaching machines,' he said. 'Machines are already available that facilitate the learning process and are particularly adapted to learning reading vocabulary.' *—Canadian Press.*

New Look For Logging

Loggers of fifty years ago would be lost in present-day logging camps. This item from the VANCOUVER PROVINCE describes some of the new equipment and techniques which have transformed the industry in the past half century.

AN OLD-TIME handlogger who cut timber in the coastal forests 50 years ago wouldn't recognize the old place any more.

The magnificent stands of timber are still here, marching in phalanxes down the mountain slopes, although they're a little more remote than before.

And the loggers are here, with their caulk boots and suspenders and work shirts, although they wear hard hats now.

But new equipment and techniques — many of them introduced on the coast only in the last few years — have revolutionized the industry.

They have pushed back the economic margins of the forests, allowing timber to be logged which was previously too costly to cut.

They have increased productivity per man, although today's loggers have a shorter work day than their predecessors.

They have changed the face of the forests as 'patch' logging succeeded earlier 'clear cut' methods.

And they have changed the very sounds of logging. The soft whistle of the railway engines which hauled the logs down the mountain valleys have been replaced by the roar of the big logging trucks. The clatter of the speeders which carried the loggers to work has given way to the rumble of the 'crummies' in which the men commute. Many old logging camps are silent now, since speedier transportation methods allow loggers to live with their families in the coastal towns.

The switch from rail to truck logging marks the biggest change within the industry. Rail logging started in the Ladysmith and Chemainus area in the 1890's. Conversion to trucks has taken place in the big Island logging divisions mainly in the last ten years.

At MacMillan, Bloedel & Powell River Ltd.'s Copper Canyon logging division near Chemainus, 15 logging trucks are doing the work handled seven years ago by five locomotives and about 20 rail cars.

Tom Coates, manager of MB & PR's Chemainus logging division estimates that truck operation has boosted man-day production at least 100 per cent above that achieved during the days of rail logging.

Copper Canyon was converted to truck operation in 1953, Mr. Coates said. Truck logging was first introduced in the 1920's, but the equipment was too light for coastal operations.

When equipment was later improved companies, faced first with the depression and then with the Second World War, lacked the capital to convert.

The companies had a huge investment tied up in railways and equipment and the cost of logging trucks and road construction required a substantial outlay, explained Mr. Coates.

In addition, logging equipment was geared to a rail operation and truck logging called for new equipment.

As production costs rose, coastal operations converted to trucks.

Trucks cut down labor requirements; during the days of rail at Copper Canyon, about 50 men were needed to lay steel.

Trucks, with far greater manoeuvrability than rail, gave more flexibility to logging. Previously it was sometimes necessary to set up a rail operation in uneconomic timber, explaind Mr. Coates.

A flood of new, more efficient equipment followed the development of truck logging, some of it only recently introduced.

At Copper Canyon three different operations show the old and new in logging.

One logging side is a skidder operation, a veteran of the woods. The skidder is yarding logs in a big circular swath nearly a mile in diameter. The logs, attached to cables radiating from the wooden spar tree, are skidded as far as 2,600 feet to the loading platform, where a tree-rigged heel boom loads the logs, one at a time, onto the truck.

The loading requires two men, one to attach tongs to each log

before the heel boom drops them on to the truck and another to remove the tongs.

Another side is a high lead operation with a portable steel spar tree and a hydraulic tong loader. The portable spar is mounted on a converted U.S. army tank retriever and allows greater manoeuvrability. The hydraulic tongs pick up each log and drops it on the truck, doing away with the two loaders needed at the skidder operation.

At another logging side a 60-inch grapple, mounted on a Washington track loader, is working. The grapple can load two and three logs at a time onto the truck and also does away with the need for two loaders.

The skidder operation requires 18 men and handles about 90,000 board feet per day. A week is required to rig the spar tree with its 21 guy lines.

The portable spar and hydraulic tong loader operation requires six men and can handle 50-70,000 board feet per day. The portable spar can be set up in only two hours.

The grapple loader, which also requires fewer men, is much faster than either of the other two; it has loaded as much as 194,000 board feet, or 16 logging trucks in one day.

Mr. Coates says man-day production is 50 per cent higher with the portable spar and grapple loader than with the skidder operation.

These methods are only a few of the changes taking place in logging. There is setting access logging, where caterpillars mooching through the woods pick up logs and move them to the loading platforms. There is the snorkle, an ingenious device invented at an MB & PR logging division which saves the loaders from lugging the loading tongs by hand over the bucked logs and through the underbrush to the point where they are needed.

There are radios to speed up communications and trucks which blithely churn their way up steep slopes over impossible roads.

Caterpillars and equipment on tracks can operate even in snow. Greater manoeuvrability allows long range planning of logging operations which can take into account fire hazards in the summer and weather conditions in the winter. **—Pat Carney.**

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer mechanic, teacher, preacher or house wife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

'. . . . . IS A SOUNDLY SCIENTIFIC EFFORT TO RESTATE ECONOMICS ON A PURELY PHYSICAL BASIS.'

—H. G. WELLS

TECHNOCRACY DIGEST

NOV. '60

Shall The Slobs Take Over?

Technocracy's Blueprint

Physics and Politics

Electronic Ship Finder

The Shock of Technology

Printing Pressures

Australian Steel

Science Shows the Way

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The Quarterly Survey

RECESSION JITTERS

Increasing numbers of economists fear that the United States may be headed for a business recession. The swift - moving economy has slowed its pace so extensively that such a recession may be difficult to avoid. This feeling is more wide-spread and distinct than at any time since the start of the 1957-58 downturn.

A slowdown in the U.S. economy would seriously affect Canadian prosperity since the U.S. is Canada's top market and main source of foreign capital.

The American economy, rising sharply earlier this year, now is in what a highly-placed federal authority describes as 'a state of instability and is levelling off.' He said the problem is one in which 'there is a squeeze on profits, demand has slacked and inventories have declined.' He figured the 'stagnation' would end next spring, but expected unemployment to grow, particularly in the winter.

The Wall Street Journal said recently that 'There's likely to be an election-day feeling of prosperity,' but added that many economists 'get the sensation that not long after election day big-spending consumers and expansion-minded businessmen will be taking a breather.'

If this should develop, said the Journal, 'A victorious Nixon or a triumphant Kennedy could enter the White House to find a recession looming as his paramount immediate problem.'

Editor's Note: The abundance of North America is catching up with the Price System, as the above observations by its apologists indicate. They are correct in their pessimistic conclusions, but the line of reasoning that brought them to those conclusions is faulty. A major example of this is their concern over declining inventories which they insist must be increased. How ridiculous can they get? The existing inventories are already in excess of $150 billions more than the consumers' ability to buy them. They do not seem to realize that that situation is a prin-

cipal contributor to their recession jitters.

BANKRUPTCIES INCREASE

More than 170 firms went out of business in Canada during August leaving behind liabilities in excess of $9.1 million.

According to the latest report by Dun & Bradstreet Canada Ltd., business failures in this country rose to 173 in August, an increase of 64 from the same month last year and the second highest toll of the year.

It was exceeded only by March when failures numbered 186.

So far this year, the rate of business failures is running close to 30 percent higher than in the previous two years. Total to the end of August was 1,218 compared with 922 in the 1959 period and 920 in the previous year.

Dollar liabilities, after a steep drop in July, surged again in August to $9.1 million, almost double the previous month's volume and one-third larger than the same month last year.

Casualties of all sizes were more numerous in August, according to the Dun & Bradstreet survey, but the most noticeable upturns occurred among the very small (under $5,000) and exceptionally large ($100,000 and over) firms.

Failures were up in all industry and trade groups except service. Tolls were appreciably heavier in manufacturing, construction and retailing. In the latter group, failures reached a record high.

Geographically, more businesses failed in all provinces except Manitoba.

Editor's Note: Just another straw in the wind. In one of their numerous business surveys, Dun and Bradstreet Canada Ltd. blamed inexperience and incompetence for many of the failures. While this is undoubtedly the case, it would seem probable that the failures of earlier years could be attributed to the same reasons in like proportion. The marked increase in bankruptcies this year, therefore, must have its cause in something more basic—such as a general decline of the monetary economy itself. In the light of the lead item of this survey, need more be said?

FARM POPULATION

WASHINGTON — The U.S.

Agriculture Department states that the farm population has been declining for 100 years or more and is expected to get even smaller.

In 1860, farm people made up an estimated 65 per cent of the United States population. Now they comprise only 12 per cent.

In 1933, a depression year, there were 32,400,000 persons on farms. This was about 26 per cent of the total population. Farm population dropped by more than 7,000,000 in the next 17 years. By April, 1950, the farm population was 25,100,000, about 17 per cent of the total.

Between 1950 and 1959 the farm population continued to decline. In April, 1959, there were 21,200,000 farm people. This was 12 per cent of the total population of the United States.

From 1950 to 1959, the annual rate of net immigration from the farm population was 3.5 per cent. This is the same as the rate in the 1940's, but is higher than rates for the 1930's and 1920's.

There are fewer farmers because a larger number is not needed. The average productivity of United States farm workers since 1940 alone has increased more than in the previous 120 years. In 1820, each farm worker produced enough to meet the needs of four persons. By 1940, this figure had risen to 11. By 1958 a farm worker produced enough for the needs of 23 persons.

Since 1940, according to the Agriculture Department, farm-worker productivity has more than doubled, total output of farm products has increased about 34 per cent.

The technological revolution in agriculture — the change from horse and mule to tractors and electric energy—obviously made it impracticable for all the 39,000,000 farm people of 1940 or the 27,000,000 of 1947 to remain in farming.

★ BIRKETT WILLIAMS, President of the National Auto Dealers Association, reports that U.S. dealers are stuck with a record inventory of 800,000 new cars, about 600,000 of them 1960 models which are expected to be sold at distress prices. **—Vancouver Province.**

★ FRANKFURT—Among the new household inventions that were put on the West German market this year: A gadget that darns socks without requiring the wearer to take them off. **—Vancouver Sun.**

Shall the Slobs Take Over?

The slob is a crude person, governed more by feelings and habits than by intelligence and discernment. He likes things simple and primitive in a social setup that is prepared for him. His kind endangers the Continent by possibly gaining control of policies and actions.

THE human species is capable of operating on several levels of dignity and achievement. The highest levels are achieved by only a minority, part of the time. The lowest levels attract the great majority most of the time and the rest of the people much of the time. The lowest human level is that of the slob, and it is with this level that we shall concern ourselves now. (There are humans who 'operate' at still lower levels — at sub-human levels—but they are defective, senile, or temporarily incapacitated. These are incapable of taking care of themselves and need assistance or guardianship. We shall not dwell on them at this time.)

The slob is able to get by in a social setup that is prepared for him. Otherwise, he is a bum in the literal sense. The slob is a crude, stupid person, whose actions are governed more by feelings and fixed habits than by intelligence and discernment. He is selfish in petty ways and is disrespectful of the welfare, comfort, and peace of mind of others. He tends to be immature and sadistic. He prefers decisions made through force and violence to those made through reason, knowledge, or experiment. He lets his personality show up in evident form when behind the steering wheel of an automobile.

The slob finds himself at home in a mob, for it operates on the level which he understands and appreciates. The mob is a senseless, violent force, dominated by emotion; and it is devoid of constructive concepts. The slob despises constructive concepts; he revels in destruction. He likes things simple and primitive; complexity confuses him and problems stymie him. His particular outside interests and adventures centre in petty contests, the outcome of which hold him in vital suspense. He is a

sucker for ball games, fights, and horse races. In these, he prefers the role of spectator and petty gambler rather than that of player since personal participation requires talents and application which are beyond him.

Sometimes the slob likes to travel, but more often he prefers to stay at home, or to go repeatedly to some familiar resort. His curiosity does not run deep enough to generate a real interest in places and things. He prefers a cozy, familiar little world of simple things and events. When he travels, it is not to appreciate and ponder strange things so much as it is to acquire the prestige of having been there. He is devoted to getting his picture taken in distant and famous places and showing the pictures around to his associates. His discernment of where he has been or what was there is essentially nil. The tourist trails and 'attractions' of America are clogged in season with such slobs going to the conventional places, doing the conventional things, and trying very hard to look important to other slobs. Since the slob has nothing of intrinsic worth to offer others, he tries desperately to impress them with superficialities; and, in turn, he is impressed by superficialities.

The slob, when he does aspire to 'higher values,' is a devout status-seeker. He consciously and overtly vies with others in this quest. He seeks to be a bigshot on unearned accessories, for an earned status is not within his capabilities. Further, he does not distinguish between earned and unearned ratings. To the status-seeking slob, houses, clothes, automobiles, associates, job titles, sports, and socializing are all appraised with an eye on the status-rating chart. Status within his group becomes the most important value in his life. He will work hard, squander his earnings, infringe on the welfare and comfort of others, and develop an anxiety complex within himself for the sake of status-rating.

To take a detached, impersonalized view of anything is very difficult or impossible for the slob. In the contests that he follows as a side-line spectator, he becomes personally immersed. If his side wins, he feels ecstatic; if it loses, he feels personally de-

feated. When a decision in a ball game goes against his side, he is all for throwing pop bottles at the umpire. Since there is no satisfaction (or status) in being on the losing side, he will switch sides if necessary to be among the winners.

The slob seldom plans ahead, living from day to day as circumstances permit. Rather than having a savings 'for a rainy day,' he tends to be in hock to his creditors. Living superficially in accordance with immediate expediency, one would suppose that his life would be chaotic and unpredictable; but it is not. At the core of his existence is a strategic pattern that is simple and solid. He may be sloppy and fickle about the details, but he is very stubborn about the general course; that is what saves him from disintegration. Having no strategic sense of his own, he absorbs his life plan from the group in which he grows up.

In the main, this 'strategy' involves a few simple elements. As a child, his main ambition is to 'grow up.' During adolescence this ambition becomes the prime motive in his life; he goes out of his way to prove that he is no longer a child. This evolves into a pattern of employment, marriage, and a family. He goes along with the ebb and flow of the society in which he lives. He makes a big to-do about the little things and events in his life; being incapable of distinguishing between the important and unimportant, he gives them all equal emphasis. Having no deep interest, he finds himself unprepared for retirement. Hence, he holds onto employment as long as possible; then, when forced to retire, he listlessly devotes himself to his ailments, to following certain sports events, to watching television, to bumming around with cronies, and to worrying a little about salvation. In the end, he wants a decent funeral. If circumstances have been kind to him or if he can get on social welfare, his last years may not be too uncomfortable; otherwise, he may find only hardship and misery, perhaps as a welfare case.

On the whole, the life of the slob is of a pattern that has been accepted by the majority. He is not interested in change other than a gradual upward improvement in his own personal status.

He is willing to let the important decisions and problems be handled by 'experts.' Sometimes he can become excited enough about a political election to go out and vote; but, when he does, the motivation is more often to vote against a candidate than for one. If he has not inherited a traditional pattern of voting, his decision is generally based on some superficial matter that has no relationship to the candidate's functional capability. The slobs elected Truman, didn't they? And they elected Eisenhower twice!

When the slob does happen to come into considerable money, his tendency is to squander it. He may lose it betting on some gamble or 'blow' it on being a good time Charley. If he is personally ambitious, his tendency is to 'go Hollywood' — to try to be a big-shot. In other words, he will want to become bourgeois in pattern, taste, and social status. He will insist on having all the paraphernalia that goes with bourgeois pretense whether he has any use for it or not. Above certain levels of Success, this includes an outdoor swimming pool—even if he lives in water-deficient California, he must have a swimming pool. His money must go to enhance his own personal pleasures and promote his importance in his neighborhood. He never thinks of sponsoring the advancement of knowledge or contributing to the general welfare. He may give to some conventional charity or to some individual person in need, but he wants personal publicity to go with it.

The slob may be crude and stupid, as judged by general social standards; but, within the range of things he understands, he can simulate a certain amount of cleverness. (Even a sheep is 'clever' within its limited field of understanding.) He can work reasonably well at a routine job (he likes routine); he can run a conventional business; drive a truck, and perform many other useful functions. He may acquire a few skills that do not call for too much discernment or ingenuity. He may, on occasion, squeeze through college; he makes a devout alumnus.

When a person seeks social recognition through possessions or position rather than through personal achievement, you know

that he is dominated by motivations of a slob. To such a person, status is what counts far more than how that status was acquired. He views a big-shot gangster with the same admiration (perhaps more) than he does a renowned scientist or inventor. It may be that his greatest ambition in life is to have his ticket in the Irish Sweepstakes turn up a winner. He figures that would make him an important guy; and it would to other slobs (also to predatory parties, including the collector of internal revenue).

When the slob achieves some recognized degree of success in the social system, he may feel important enough to seek political office, and he is usually encouraged to do so by other slobs, and promoters, who want to go along for the ride. By getting clever publicity men to manage his campaign and write his speeches, the slob may acquire the appearance of being a 'real leader' to the undiscerning. Once in office, he can have lackeys do his work and his thinking for him; and he can learn a few generalized platitudes to recite when called upon for a personal statement. With enough promotion and the absence of controversial deeds on his record, the slob conceivably may be maneuvered into the presidency or Prime Ministership. If he can exude a certain amount of charm, accept direction from the dominant interests in the status quo, and observe the approved amenities, he may even be a 'good president' although a weak one.

When you see a man running for political office because he wants the distinction of being in that office, it is prima facie evidence that he is a slob. The slob wants political office for the sake of personal fame and aggrandizement rather than as a function for the general welfare. His first concern is to get into office, and his next concern is to stay in office.

There are other reasons, of course, for seeking political office. One may seek the office to be in a better position to 'play ball' with The Boys in the rackets. That motivation, however, requires more talent and discernment than is to be found in the slob. Still, the procedure of getting into office and staying there is the same. . . . If a person

seeks political office out of sincere desire to be of beneficial service to his fellowmen, he is defeated before he begins; for one thing, he is too naive and decent to do what is necessary to win. It is not a sincere program for the social welfare of the nation, state, or county that gets a politician elected to office; it is his personal appeal to slob values and fixations. In some areas, this means nothing more than getting nominated on the Democratic ticket; in others, he's in if he gets nominated on the Republican ticket. In some areas, it means membership in a certain church; in other places, skin color or national background is all-important.

Since the majority of voters vote as slobs for slob reasons, the American politician must orient his interests and function to appease this majority. Also, since the memory of the slob is short and his action is influenced by events which are close at hand and of recent date, the political officeholder can ignore his welfare in the main until just before election. In the meantime, he can concentrate (as a sideline to playing the rackets) on getting publicity for himself, which pleases him at the same time it impresses the slobs with the illusion that he is important and doing important things. In getting publicity, he is, therefore, an opportunist. One way of gaining publicity and a 'reputation' for himself is that of entering negotiations of a Labor-Management dispute at the last minute, when it is about to be settled anyway, then claiming credit for having settled it.

A euphemism for slob is 'the common man.' He is common because there is nothing distinctive about him; he is one of the herd. However, the two terms are not exactly synonymous, since 'common man' refers to the individual in toto and is a continuous condition, while 'slob' refers more to a pattern of behavior and may not be in effect at all times. Even the Uncommon Man sinks into the behavior pattern of the slob part or much of the time. This is particularly true when one is frustrated, excited, or confused. It is animal nature to 'go primitive' when the more advanced neural controls fail to meet the immediate need, or when those controls

are chemically rendered weak by narcotics. Intensified emotional conditions may cause one to behave as a slob, or disrupted environmental circumstances, or a breakdown or disturbance of his conditioned fixations, may bring about that behavior. More often, however, it occurs when one merely lets himself lax and 'go slumming' (or, in this case, slobbing). When it is done for release of tension or recreation, it may serve a useful function and no harm is done.

When slobbing is resorted to as a personal conditioning to condone action or to effect decisions which one would not entertain at a higher level of integrity, it can be harmful or dangerous to the society. We have just seen, in the United States, how political party conventions are dominated by slob techniques and slob appeal. The decisions are made on the basis of emotionalized hoopla and desire to be on the winning side more than they are made on the basis of clear thinking and unselfish concern for the national welfare. In a 'democracy' where all votes are equal in the count, the vote of the slob will win out, for it is the majority vote. A contest is achieved only by having alternative 'issues' on the slob-appeal level; and it is on that level that political contests are conducted in the United States. Then we wonder why we are so chronically afflicted with lousy governments!

When the leaders of a nation decide on a war, it is important to them that they gain popular support for it. This can best be achieved by working on the slobs until they develop a war fever. This is done by promoting hate for the would-be enemy. Most declarations of war are made when mobs of slobs are worked up to an emotional frenzy ignited by some minor 'incident.' Under such conditions, the dissenters are in personal danger of mayhem by the slobs. For their own safety, they are compelled to accept war. Thus, the slobs are a setup for any rabble-rouser who is bent on violence or destruction; and, as such, they are a menace to the society. The United States and Canada are loaded with organizations of slobs which can be used by insidious interests to administer terror, violence, destruction, or

other mob action to effect a certain result which cannot be achieved under Law and Order.

No one nation, race, sex, or social system has a monopoly on slobism. All nations and societies of the past and present have been infested with slobs and more or less dominated by slob values. Africa, Russia, China, Latin America, India, West Europe—they all have their slobs. Among the slob elements in the United States are the Dixiecrats of the South and the Yankees of the North; the midwest and the far west have their own peculiar brands. Most minority groups are activated and maintained by slobs. Canada has a large assortment of regional, racial, and ideological slobs. The slobs are strongly partisan over petty issues. They readily form into gangs or mobs to promote and demonstrate for those partisan issues. They like to pose as super-patriots, donning costumes, joining parades, and carrying flags and other symbols of their chauvinism. During the 1920's, the slobism of California held the American spotlight; now it is the slobism of Texas that is getting the big play.

Only a nation dominated by slobs would set as its national goal the rivalrous maintenance of superiority of accomplishment over that of some other nation. The United States is at present in that sad predicament. Its leaders are possessed with a mania for beating the Russians at whatever is in the spotlight at the moment; and they try to direct the national policy and endeavor in that direction. Hence, the United States is not able to develop a distinctive policy of its own or set strategic goals that are of particular significance to the North American Continent. First, it must find out what the Russians are trying to do; then, either try to outdo them or oppose them. It is the childish type of behavior that one would expect from slobs, not from statesmen. Since the Russians are devoted to state enterprise economy and a more-or-less collective approach to the solution of economic problems, the United States must take the opposite course — keep the government out of business and operate a private enterprise economy no matter how stupid or archaic it may be in design and how un-

workable it may be in practice. The Cold War is a 'natural' for the slob elements.

In contrast, statesmen would set out to develop their own nation and their own Continent to its optimum potential and to advance knowledge, technology, and the general welfare of the population; but not so the slobs. The latter despise fundamental change; they lack the ingenuity necessary to adapt to change. They much prefer a fixed society with which they can become familiar and which does not disturb them with innovations.

The chief adventure for the slobs comes from their joining in a mass mania over some fad, be it yo-yo, hoola hoop, some crooner, a new song or tune, or some character from history such as Robin Hood or Davie Crockett. But the slobs soon wear out the fad with over-indulgence, discard it and turn to some new 'adventure.' Strategic Continental developments are beyond their understanding or interest. When one does present strategic concepts to the society, the slobs turn to ridicule and slander; that is their usual reaction to that which is above and beyond their comprehension.

The slobs of any land tend to accept the society in which they were born and nurtured no matter how miserable it may be. They have accepted slavery, feudalism, colonialism, peasantry, sweat-shop labor, slums, Beverly Hills, and Park Avenue—whatever circumstances may bring them. They accept change only when the ground is cut out from under them and they have to move, then with great reluctance and grumpiness. Thus, the social changes in East Europe, China, Africa, and elsewhere are meeting with resistance from their respective slobs and are providing refugees — people who want to go back to what they had before. The exception to this tendency is when a superficial social movement develops among the slobs as a fad. In America, the move to Suburbia was such a fad, and the slobs fell for it by the millions.

A present great danger to this Continent lies in the potentiality of the slobs' gaining control of national policies and actions through sheer force of numbers. Since they relish violence and

destruction as an exciting form of adventure, it will be easy to 'sell' them on the idea of World War III. And it is equally easy to convince them that they have a gambler's chance at survival. When economic conditions become more frustrating for more millions of North Americans, more of them will 'go primitive' and behave as slobs, swelling the ranks of those who are already chronically that way.

Under such circumstances, it is not easy to put across a program of social advancement on this Continent; but, nevertheless, that is the task which Technocrats have set for themselves. The soft-pawed cat fights between John Kennedy and Richard Nixon provide no answer to the problems which are disturbing most Americans. So there is a good probability that the public will seek something more exciting than anything they have had. Technology is cutting the ground out from under them and they must move somewhere. The slobs have no exciting goals of their own, so they will follow the crowds. If the diehards of the status quo can get us into war, they will join the parade to war and thermonuclear annihilation.

If a movement can be organized to lead them away from war and to a higher social order on this Continent, the slobs will go along with it. The gamut of Price System palliatives has been paraded before the public, and none of them have seemed to work, with World War II coming the closest. If World War III can be avoided, the public will have to turn to something else; and the chances are it will want something more exciting than anything they have had in recent years. Technocracy offers the people of North America the greatest social design ever offered to any people; and it is technically correct and socially feasible. It is a plan, not a political promise.

It is now up to the North Americans who are capable of operating above the slob level to take the lead in this Continent's social destiny and to direct it away from war and toward a new social order of abundance, security, and freedom from toil for all, including the slobs.

—Wilton Ivie, CHQ.

Technocracy's Blueprint

Technocracy's blueprint was drawn to meet the specific requirements of a problem unique to this Continent. It contains all essential ingredients for the smooth functioning of North America's social mechanism to provide a high living standard for all citizens.

TECHNOCRACY has the blueprint for the functional operation of North America's social mechanism.

For over a quarter century Technocracy Inc. and its members have been informing their fellow citizens of that blueprint through public lectures, personal contact, literature distribution and other media. Yet the question 'What is this blueprint and where is it?' still persists. Obviously many people do not understand what a blueprint is, or they would not need to ask the same question so often.

Primarily, the difficulty appears to revolve around the matter of magnitude. Most people think of a blueprint in its limited application as the photographic print on blue paper used by carpenters and engineers as their guide in constructing buildings or other specific projects. This is correct as far as it goes, but the definition can be carried much further. Basically, a blueprint is a pattern which conveys instructions to anyone who understands it, being only incidentally blue in color for functional reasons peculiar to the construction industry. Thus, a blueprint might, irrespective of its color, be the pattern a housewife uses to fashion a dress, the diagrammatic description of a television or radio set, the design of a ship, the layout of a shopping centre, or the particulars of operation for the intricate physical and social mechanism of an entire Continent. The problems encountered in going from the least to the greatest are qualitative and quantitative rather than basic, for the same objective approach must be applied throughout if the most satisfactory results are to be achieved. Something that all have in common is their conveyance of procedural directions to

those who understand the respective types of blueprint.

Before a blueprint is prepared, the scope of the intended project must be known. Whether one or many buildings are included, this knowledge is necessary for everything within the project must be planned to fit within the outside dimensions allowed for it. If the project is a single building, the designer must know its intended use as well as size, and will, in addition, want to know its location, accessibility to transportation, communication and power facilities, and numerous other pertinencies. All of this preliminary data must be collected before the blueprint's preparation is commenced.

The designer's findings will suggest to him what construction materials he should specify. He will also know from them how many, if any, elevators are required, how many telephones, the particulars of lighting and heating, and the extent of the plumbing needs. These and numerous other considerations will all be part and parcel of the final blueprint.

A blueprint's specifications cannot be contained in a single drawing except in very simple plans. Even an average dwelling-house may require a dozen drawings to cover all the small- and large-scale details of construction, but each is only a part of the total blueprint. The overall specifications must determine the scope of each of the integral parts which obviously cannot be planned independently of the rest if they are to be satisfactorily put together. The completed blueprint is the sum of all of its various parts, whether they be drawings, charts, diagrams or written instructions. In most cases, far from being the work of one person, blueprints represent the end result of a close liaison amongst a group of blueprint specialists who, knowing the full plan, are able to integrate their specialized phases therein.

After the blueprint is completed it goes to the builders. While they may have had prior consultation with the designers and have some knowledge of what is expected, they must nevertheless depend to a major degree upon the blueprint itself for instruction. How closely their finished job resembles the origi-

nal intention depends upon (1) how adequately the blueprints were drawn, and (2) how well the builders followed the instructions and put them into effect.

Are blueprints effective? The redundancy of this question is manifested in the existence of practically every building and piece of physical equipment on the Continent. No hydroelectric development, automated factory nor anything else that has contributed to North America's high-energy conversion and consequent abundance of consumer goods could have been installed without prior planning and consequent blueprinting for the instruction of personnel who were competent to materialize the plans. Blueprints have proved their functional merit wherever they have been used.

Strangely enough, they have never been applied in the field where their greatest benefit would be realized—namely, that of social governance. It is paradoxical that so great care should be taken in planning and running certain limited operations within our society, but that the social mechanism as a whole be permitted to carry along haphazardly under its own momentum without direction or purpose —unless the frantic attempts to sustain the obsolete Price System can be defined as direction and purpose. While we recognize the foolhardiness of fashioning individual parts of an intricate machine, then trying to integrate the independently - designed pieces into a smoothly functioning unit, we somehow seem to expect such a procedure to work in our social administration. Certainly, the complex nature of our technological mechanism has forced **some** integration even to keep the Price System running, but for the most part planning has never been done on more than a piecemeal, localized scale. We are working from the wrong end of the stick—from the parts to the whole rather than the reverse as should be the case. A blueprint of social operation would determine the total needs of all people within its scope, and would then find out how those needs could best be met. The integrated social mechanism deriving therefrom would be the result of considering the problem as a whole and letting it deter-

mine the shape of all parts—just as is done in the blueprint of a building or piece of machinery. Designing the blueprint for the operation of an entire social mechanism is not essentially different.

The blueprint of social operation which Technocracy Inc. has been publicizing across North America since the early 1930's is the result of extensive prior research and planning. This work was done by a small, select group of scientists, engineers, educators and economists headed by Howard Scott, the present Director-in-Chief of Technocracy Inc. Realizing that unique circumstances had emerged from North America's participation in World War I, these men, calling themselves the Technical Alliance, launched into an investigation to determine what had happened to the economy.

Their studies soon confirmed their suspicions that a major irreversible change had taken place in the method of doing work on this Continent. The employment of human energy in industrial processes had reached its zenith during the war, and would henceforth be an ever-declining factor as technology steadily displaced it. It was at once seen that this would have a drastic effect on the monetary economy which depended on the sale of manhours for the purchase of all commodities.

Despite the importance of this finding, the knowledge of it would be of little use unless the physical means were at hand to do something about it. The Technical Alliance realized that the only way to determine this was to make an energy survey of the entire Continent to learn what was here in the way of energy sources, mineral resources, trained personnel, arable land, forests, et cetera. In short, it meant finding out all that could be learned about the land area.

The survey, which took several years, proved North America (plus that portion of South America north of the Amazon jungles) to be by far the richest in resources of any part of the world. Moreover, the area had a relatively small population and high proportion of trained technical personnel compared with other areas. An unsurpassed network of lakes and rivers plus a wide range of climatic conditions

between the polar and tropical extremes rounded out the extremely favorable picture. Here was a land area which could sustain its population at a very high living standard for a thousand years or more — providing its facilities were competently administered.

This was obviously far from being the existing state of affairs. In the first place, the entire land area was arbitrarily divided into several national entities all claiming sovereign control over their respective parcels of real estate. These were further divided into innumerable provinces, states, municipalities, counties and lesser political divisions—all having their own graduated measures of local authority, and largely competitively opposed to each other. This indiscriminate slicing, done in complete disregard of the Continent's natural topography, could only unnecessarily complicate functional administration — quite irrespective of other interferences.

It was apparent that these political divisions and their political governments were but important parts of the actual governing control of North America, namely, the previously mentioned monetary economy. This was called the Price System by the Technical Alliance and was defined as any system which effects the distribution of its goods and services by means of a system of trade or commerce based on commodity valuation and employs any form of debt tokens, or money. However well or badly it had worked under the natural scarcity conditions of the past, the indications were that the Price System's future in North America was decidedly dark because of the increasing impact of abundance. Its own scarcity-born inadequacies must eventually cause its collapse under the weight of that technology-produced abundance.

The Technical Alliance, having at hand all information required to support its next step, studied the data before it analytically and without any preconceived notions of what should or might result from its intensive research. From its midst was drawn up the most comprehensive and extensive blueprint ever drawn up anywhere at any time. Here was a blueprint for the function-

(Continued on Page 33)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

NOVEMBER, 1960 *Compiled by Editorial Staff* No. 178

Electronic Ship Finder

SAN FRANCISCO—A thousand ships—Navy vessels and merchantmen—scattered over the Pacific Ocean now are kept under constant surveillance in San Francisco by electronic means.

The headquarters of the Western Sea Frontier can get a run-down on a ship, or group of ships, in a matter of seconds, or, at most, a very few minutes.

The answers to questions such as a vessel's name, country, course, speed and position are supplied by an electronic computer in the operational control centre of the Sea Frontier headquarters.

The Navy cited the following examples of situations that might arise and how they would be dealt with by the computer and its operating crew of nine officers and twenty-nine enlisted men:

'An unidentified submarine is spotted 500 miles west of San Francisco. Within six minutes the exact position of every ship within a 100-mile radius is located. A destroyer is dispatched to investigate.

'A missile is about to be fired from Vandenberg Air Force Base, 300 miles to the south. "What is the density of shipping in the target area?" asks the commander of the Pacific Missile Range. Ramac (the computer) comes up with the answer in three minutes.

'A seaman aboard a merchant ship en route to Australia is stricken with appendicitis, requiring immediate surgery. In five minutes a ship with a doctor aboard is pinpointed. The ship is rerouted toward the merchantman.

'The commander of a Seattle "week end warrior" squadron wants to give his reserve pilots some realistic training in ship identification. He asks for—and gets in seconds—the projected positions of ships within a 200-by-500-mile rectangle.'

The computer, resembling an oversized phonograph console, was built by the International Business Machines Corporation. The $250,000 article originally was designed to handle insurance records and keep sales data and inventory information in business houses.

MEMORY UNIT EXPLAINED

It was rigged up for Navy use and is described as 'the first computer to be used to keep track of ships over an area as large as the Pacific Ocean.'

The machine's 'memory' units store up to 5,000,000 items of information. Instructions fed to it enable it to supply the required data in a jiffy. A Navy spokesman said it not only could remember details about individual ships but it also could 'navigate' ahead to show a shore-based commander what a vessel's position should be the next day. Search and rescue operations were begun, he said, if any ship was four hours overdue. **—New York Times.**

★ SAN FRANCISCO—Guests who park their cars in the 500-car garage of the new Jack Tar Hotel register via closed-circuit television, and receive keys via pneumatic tube. The face of a registering clerk upstairs is seen by the couple on a TV screen. He, in turn, sees them or a duplicate screen.

As they discuss rates and accommodation the clerk flicks a switch to light a typical hotel floor plan, enabling guests to choose a room. Check-out may be accomplished also by closed-circuit TV, with change and receipted bill coming by pneumatic tube. **—Vancouver Sun.**

New Corn Increases Yield

MILFORD, Ill.—An Illinois hybrid corn company has announced plans to market a new type of corn that it said would increase per acre yields 20 to 25 per cent

Each plant would produce up to ten small ears rather than the single large ear grown on most present stalks. The new plant is the product of a decade of research and stems from crossing modern corn with a primitive corn that grows wild in Guatemala.

If the multiple-ear corn lives up to the expectations of its developer, Crow's Hybrid Corn Company here, it could swell the growing surplus of the grain already in Government storage. The Department of Agriculture now has a six-month oversupply, valued at more than $3,000,000,000, in its bins and under price-supported loans. An expected bumper crop of more than 4,000,000,000 bushels this year will add to the surplus.

Walter J. Mumm, an agronomist who is director of research for the company, said this week that growing several ears on one stalk would 'revolutionize' corn production.

The company plans to market a limited amount of two types of multiple-ear corn for planting next year. One, designed for harvesting with a combine rather than the conventional corn picker, can be held to a stalk height of five or six feet, half that of much of today's corn.

Harvesting by combine would eliminate the need for cribs for ears as well as considerable extra handling, because shelling would be combined with picking.

The other new strain grows tall stalks and provides extra tonnage for farmers interested in silage corn.

The new ears, about two inches shorter and half as thick as present ears, are not being bred for human consumption. Mr. Mumm said they might be later by adding sugary and waxy factors.

The company announced that a full-scale multiple-ear seed production program would be started next year, with sufficient seed available for general use in 1962.

Mr. Mumm said the company had been swamped with letters from farmers eager to try the new corn.

'It will do for the Corn Belt what the introduction of hybrid corn did a quarter of a century ago,' said A. F. Crow, who owns the company.

At that time hybrid helped farmers to double their yields. Mr. Mumm said multiple-ear corn could produce 200 bushels of corn an acre under good growing conditions. Farmers now seldom get more than 150 bushels per acre.

Mr. Mumm has been working on the new hybrid since 1949, when he made the first of four trips to Guatemala. There he studied teosinte, which he described as 'an ancient relative' of modern corn. It grows wild in Central America.

He has been crossing teosinte and modern corn experimentally since 1952. The new corn plant sprouts more than one stalk, each stalk producing more than one ear. He attributes its ability to do this to the teosinte. **—New York Times.**

Automatic Autos

DETROIT—One day in the far distant future automatic automobiles may become completely automatic.

You'll get in, sit back, arrive at your destination and get out. No sweat, no strain.

Even after this becomes technically possible some experts doubt that you will really be enthusiastic about such transportation. Dr. Andrew Kucher of Ford Motor Company, for example, says he finds drivers extremely reluctant to give up control of their cars to some automatic force.

However, much is being done to make the 'extras' automatic.

There are several reasons, said one Cadillac engineer. One is that some accessories are so complicated that manual transmission is not practical. Another is that if a thing works automatically it probably

will work as the manufacturer intended, whereas if operation is left up to the driver he may do it incorrectly.

One area, not yet completely automated but in which considerable work is being done, is the heating and cooling of automobiles. 'One day,' one engineers observed, 'we'll be able to offer thermostat heating and cooling, just as in your home. We're close to it now on heating but considerable work needs to be done on cooling.'

One outstanding example of automatic operation is the continually improving transmissions. By now many of the transmissions accomplish the shifting operations with more gas economy than the average driver can accomplish with the stick-shift type—and with no physical effort.

General Motors has just completed installation of a new driver aid system on one four-mile loop at its proving grounds near Detroit. This system alerts a device in the car when the driver strays too close to either the centre line or the edge of the roadway. Eventually it may become practical for general use.

Among special automatic devices now in operation, or new for the 1961 models, consider these:

Radios which seek the strongest station at the push of a fingertip; car trunks which can be opened with a button in the driver's compartment and which lock automatically when the lid is pushed down; parking brakes which release automatically when you shift into gear, thereby preventing operation of the car with the brake on.

Power seats with automatic settings. These will return the seat to a pre-set position if it has been changed. Buzzers that warn drivers of excessive speed. Lights that flash warnings of near-empty gas tanks. Master door locks, controlled by the driver with a push of a button. Emergency warning systems that set four rear lights flashing if you have to stop on the highway. **—Associated Press.**

★ PROVIDENCE, R.I.— Hawser made of polypropane, a synthetic fibre, has invaded the field traditionally belonging to heavy Manila rope. A polypropylene hawser that is seven inches in circumference and weighs a pound a foot is as strong as Manila rope nine inches in girth and weighing nearly two and a half pounds a foot. The synthetic rope, said to be light enough to float, does not absorb water or freeze like ordinary rope. *—Vancouver Sun.*

Brain Waves

NEW YORK.—Electrical signals from pieces of brain kept alive in glass tubes for as long as two weeks have been recorded by a team of scientists at medical branch of the University of Texas.

Theirs is believed to be the first report of brain signals from fragments of the tissue maintained outside the body in a completely artificial medium.

Besides what can be learned from the achievement itself, the techniques that made it possible promise far-reaching applications for future research.

It may now be possible, for example, to map out the functional development of the brain. Stages in the structural development of that organ have long been known. The new research should now permit scientists to find out precisely when and in what structures electrical activity first appears and how it spreads throughout the tissue.

The achievement should also have important medical applications.

The ability to keep pieces of brain alive outside their natural environment should enable scientists to alter chemical and physical conditions of the tissue culture and observe the effects under rigorous controls. In this way, more may be learned about the specific modes of action of such agents as drugs and infectious organisms on brain tissues.

The report of this significant achievement was made by Dr. Alastair W. B. Cunningham, Marshall Daugherty and William J. Rylander.

The Texas scientists, as many others before them, had tried for a long while to get electrical activity from pieces of brain tissue in culture. This had been done with peripheral nerves and with developing brains in intact embryos but never with explants of brain fragments in an artificial medium, Dr. Cunningham said in a telephone interview. **—John A. Osmundsen in New York Times.**

Ding-a-Ling! Chirp-Chirp!

LONDON—Bird-like chirping may replace the jangling telephone bell under a modernization drive now under way by the British General Post Office.

Post Office laboratories also have developed a new light-weight underwater telephone cable that the Post Office plans to lay between Scotland and Newfoundland next year.

The familiar telephone ring will definitely disappear when Britain's new electronic telephone system starts operating some time next year.

Because it takes a strong burst of power to cause a telephone to ring, the laboratories are trying out new sounds—among them a bird-like whistle—that do not require strong impulses.

The first electronic exchange is expected to go into operation in North London sometime next year. It eliminates the old system of switches and relays, replacing them with electrical impulses.

The underwater cable is designed to carry seventy-five conversations each way. The cable is made of polyetheylene and aluminum and is little more than an inch thick. About ninety amplifiers will be placed along the cable. —Reuters.

The Word Gobbler

TELEX is an electronic monster that pulses, clicks and chirrups on rows of ceiling-high racks at 428 West Hastings, Vancouver.

It feeds insatiably on messages from every corner of the globe, receiving, transmitting, sorting and digesting — and simultaneously computing toll charges.

The monster never sleeps. It draws its life from similar installations in the world's major cities, and in turn breathes the life of almost instant communication into the world of industry and commerce.

Its purpose is to transmit the written word in the least possible time, and this it does almost at the speed of light. Communication between Vancouver and Gander, Newfoundland, for instance, is instantaneous upon the pressing of a key.

The keyboard installations are in scores of offices, and each, by no more than the dialling of a number, can 'talk' via the printed word with more than 200,000 other Telex-equipped offices in almost every country in the world.

Telex is a German development that was first put into operation there in 1928. By 1938 it had spread over much of Europe, but its further growth was curtailed by the Second World War. Three years ago it reached Canada. There are now over 5,000 call numbers listed in the Canadian directory.

Printing automatically from pre-punched paper tape, Telex transmits at the rate of 66 words per minute. Average tolls per minute from Vancouver would be 75 cents to Chicago, 52½ cents to Los Angeles, 75 cents to New York and 45 cents to San Francisco.

Average overseas calls from Canadian stations cost $9 for the first three minutes, $3 for each additional minute.

It costs $45 a month to lease a Telex machine. Non-recurring installation charge is $20. Additional equipment to receive and transmit messages automatically by punched tape is another $32 a month (not essential but invaluable for record-keeping and message-repeating.) Message toll charges are also additional.

A major advantage of Telex is that the system is in operation 24 hours a day, unlike teletype services. Others are that messages are recorded, even though the machine at the other end is unattended, words and letters can not be garbled or intermixed, and a written record is produced that reduces possibilities of misunderstanding and time lost in writing confirming memos and letters.

Who uses Telex? Airlines, hotels, the RCMP (Telex can't be tapped), florists, manufacturers, truck lines, railways, insurance companies, lumber firms, grocery chains, banks, shipping lines and construction companies, among scores of other businesses and government agencies.

One Vancouver firm has cut a monthly long-distance telephone bill of $1,200 to $300 through use of Telex to communicate with branch and customers' offices across Canada. Its overseas toll charges have been cut in half. Other firms have reported similar savings.

Latest Telex development is taped, automatic data processing such as might be required by a business firm in collecting and computing weekly or daily sales and stock information from its branch offices. **—Ron Thornber in Vancouver Sun.**

★ MOSCOW—Western experts say they are flabbergasted by Soviet achievements in automation. 'They will really get way ahead unless we buckle down to work,' said one British authority attending the first International Congress on Automation in Moscow.

The British visitors said the Russians had used a 'leap frog technique'—skipping intermediate steps the West had to make—in their development of automatic devices for computation and control systems in industry. 'They sat down to think for five or six years, and now the result of this thought is beginning to pay off,' said one visitor.

The consensus of Westerners after a tour of the Soviet Institute of Automation and Telmechanics was that it was far ahead of anything in the West, with only the Massachusetts Institute of Technology remotely approaching the standards of the Russian institute. 'We've been a bit shattered,' said one Western delegate to the Congress. 'We never dreamed this level had been reached.'

What called forth the panegyrics are Russian self-optimizing systems, now in production, and pneumatic computing instruments, neither of which, the experts said, have been achieved in the West. The first of these is basically a self-correcting control system which automatically seeks the optimum level. The Russians are using it to control temperatures in steel mills and also to keep power in radio transmitters at the most efficient level.

The pneumatic computors have no moving parts and thus are more reliable than the electronic devices used in the West. They also can be safely used in such places as chemical plants, where electronic controls would be hazardous.

—Associated Press.

★ VANCOUVER—One of the more fascinating demonstrations as B.C. election results flooded communications on September 12th was the performance of the IBM electronic computer, the mechanical brain.

'It's not thinking,' an announcer said. 'It's merely interpreting the information fed into it.'

It came up early with the correct outcome, moving one cynical viewer to suggest that, next time, use of the mechanical brain might go a step farther. Instead of requiring people to vote, just feed all the information about candidates, parties and policies into the IBM, he said. One further step might be to elect IBMs instead of men to form the government. **—Vancouver Sun.**

Through the Technoscope . . .

Technocracy examines the various scientific and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

Science and Technology

HOME INTERCOM SYSTEMS ARE now in pilot production at the Utica, New York, plant of General Electric. The Radio Receiver Department describes its new product as a simple, easy to use, and eminently useful system that is full of plusses.

To use it, you simply plug a pair of units into any 110-volt outlet, push the talk-bar, and start talking. Voice signals are carried over existing house wiring, so there's no need for any new wiring between units.

As many units as desired can be used anywhere in the house, providing the house wiring shares a single power line transformer. The intercom can also be used between neighbouring houses sharing the same power line transformer. Units are transistorized, which means they can be left on at all times without overheating or excessive power consumption. They use no more power than an electric clock.

A POLYETHYLENE PLASTIC TYPEwriter ribbon has been introduced by International Business Machines Corp. Because of polyetheylene's resilience, the new ribbon is said to produce a more accurate print of the type character than fabric ribbons or previous plastic ones made from mylars and acetates, since it bends more to the contours of the letter or number. IBM says the new ribbon will make possible fancier type faces than before.

LAWMEN ATTENDING A RECENT convention of the International Association for Identification were introduced to a unique fingerprinting device developed by Chance Vought Aircraft, Inc.

Chance Vought demonstrated a little metal box that takes fingerprints instantly without ink or chemicals. The company says that the device employs an optical system to reproduce fingerprints so clearly that the pore structure of the ridges can be seen. Smudging and distortion have been eliminated.

When someone touches his finger to a small glass area on top of the box, the print pattern is immediately projected onto a TV screen a few feet away. Another model has a built-in camera so that the print image can be photographed.

The company is attempting to create a market for its new device among merchants and bankers, as well as among law enforcement and government agencies.

OWENS - CORNING FIBERGLAS Corp. has come up with a new spray coating to protect metals, wood, and concrete against corrosion and wear. The main ingredient of the new coating is the tiny flakes of glass that Owens-Corning calls Fiberglas Flake.

The coating is described as consisting of a homogeneous mixture of the flakes with resin, fillers, accelerators, and, if desired, color pigment. Thus, it can be sprayed right on, without mixing on the job. In other coatings of this type, made from chopped glass fiber roving, the base of resin and catalysts and the glass itself have to be mixed as they are applied from separate nozzles. With the new coating, a single 20-mil-thick application contains 50 layers of Fiberglas Flake—roughly equivalent to 50 coats of paint according to the Owens-Corning estimate.

THE PRODUCTION RATE FOR driving posts for highway guard rails has been increased three times with the aid of a special hole-making machine designed by Hacquoil Construction Co. Basically a one-yard dragline operating a five-ton air hammer, the unit is particularly effective in making post holes in rock fill.

Even in earth of granular fill the machine's output is much higher than that of post augers, and requires only two men to operate. 'We're handling more than 200 posts some days, and average around 180. Before we had this machine, 60 was an average and 75 a peak day,' said a Hacquoil foreman.

The machine's operation makes use of a four-foot long, pointed steel shaft slightly larger in diameter than the posts. The air hammer working in a steel frame lead, drives the shaft to the desired depth, simply displacing the material to create the hole. Rock fill is easily displaced and it takes only a few minutes to make the hole. One man operates the machine while another spots the holes and inserts the posts.

A MACHINE THAT STRAIGHTENS odd shapes in less than 30 seconds has been produced by Special Machinery Co., Winsted, Conn.

Designed originally for straightening stepped golf clubs, the machine can straighten tapered or oddly cross-sectioned tubes or rods five times as fast with an unskilled operator as was done by a skilled operator using manual methods. The operator simply pushes a button that puts the machine through a complete cycle, automatically ejecting straightened tubes.

TECHNOLOGY IS COMING TO THE aid of the urban homeowner in the form of a variety of multi-purpose power tools. In the garden department, Toro Mfg. Corp. of Minneapolis has adapted a 3-hp. engine with controls in a single lift-off unit to a wide range of uses. The engine can be used to power any one of a dozen garden and general utility tools, including a rotary mower, a six-bladed reel mower, a soil tiller, a lawn edger, a rotary-type snow plow, a pump that can bale out boats or basements, a sprayer, and an auxiliary 1,000-watt electrical generator.

A PORTABLE RECORDING CAMera manufactured by Peerless Photo Products Inc., makes photocopies of business documents at high speeds. The unit— a continuous flow reducing camera and an automatic processor in a single cabinet mounted on casters—copies about 1200 check-size or 450 letter-size papers per hour. No water supply is needed. Distributor of the camera is Charles Bruning Co., Mount Prospect, Ill.

ALUMINUM FOIL COATED WITH an adhesive that forms a permanent bond with woods and plastics is the newest product of Aluminum Co. of America. The foil is applied by a hot press. Said to be highly resistant to heat and moisture, it can serve as a base for paint, a light reflector, or a strengthening agent. It is available coated on one or both sides in gauges down to .001 and widths up to 50 inches.

A NEW TRAFFIC RADAR OF SUCH sharpness that it can discern a slowly moving vehicle, or outline a plane clearly enough so it can be recognized by type, has been developed by Amperex Electronic Corp., Hicksville, N.Y. The new system has a high frequency (35 billion cycles per second) magnetron tube that sends out a short pulse only 2/100,000,000 of a second in duration. As a result, the radar is able to resolve objects down to 4½ yards in width or depth.

A NEW MIDGET TRANSISTOR radio is the size of a matchbook and tips the scales at less than an ounce. To listen to it, you wear it on your ear like a hearing aid. It's said to have a range of 15 miles, using a pair of one-inch batteries with an average playing life of 100 hours. Micro-Ceiver, Inc., of Englewood, New Jersey, produce it.

A CRANE-LIKE VEHICLE, MANUfactured by Pacific Coast Engineering Co., Alameda, Calif., spans a railroad track and parallel truck roadway simultaneously to load and unload cargo containers on train and truck. Its driver doesn't even have to back off or carry containers all the way down the train to transfer them from one carrier to the other. Electric motors and brakes control the vehicle's loading mechanism. It is marketed by its manufacturer and by Pullman-Standard, Trailmobile, and Transport Leasing Co.

PACKAGING OF DIFFERENT SIZED and shaped articles and of products which hitherto have been either hand-wrapped or machine-wrapped with human assistance has now been simplified by a new automatic packaging machine developed and marketed by Hayassen Mfg. Co., Sheboygan, Wisconsin.

The firm claims its machine to be unique in that its method of forming the package is independent of the item being wrapped. This permits it to be used for the parcelling of products of widely varying sizes.

★ THE STEEL INDUSTRY'S daily consumption of fuel oil is enough to fill over 400 tank cars of 10,000 gallons' capacity each. **—Steel Facts.**

(Continued from Page 20)
al operation of all equipment for the entire Continent to achieve the maximum efficiency in the production and distribution of goods and services.

The drawing of the blueprint completed the work of the Technical Alliance research group. It was succeeded by the present organization, Technocracy Incorporated, an educational, research, membership organization specially formed to make the blueprint known to responsible North Americans.

The blueprint, simply called Technocracy to differentiate it from the incorporated organization, has no precedent in scope or form since it was drawn to meet the specific requirements of a problem that was and is unique to this Continent.

The Technate of North America, as the area covered by the blueprint is called, covers the entire mainland area of the Continent plus the northern tip of South America, and all peripheral islands. Hawaii and certain other mid-ocean islands will also be included for strategic or recreational reasons. All political boundary lines. between and within Price System nations, are absent from the Technate blueprint to allow the greatest facility of movement and function throughout the Continent.

The Technocracy blueprint provides for an administration based on the numerous functions which must be operated within the area to maintain an optimum standard of living for all citizens. About a hundred 'functional sequences', including those of public health, education, transportation, communications, agriculture and housing, are represented on the Continental Control. This coordinating body, comprising men and women whose demonstrated superior abilities in their respective fields has resulted in their appointments as Sequence Directors, will be the top planning group determining the deployment of personnel and equipment for the most efficient execution of progressive steps of the blueprint. They will decide what to do, and then see that it is done with minimum material wastage and duplication of effort. Their presiding officer will be the Continental Director, chosen by them from their own midst.

The blueprint further provides for a system of distribution based on energy measurement rather than commodity valuation. Since the only common denominator between production and distribution is the expenditure of energy, it is accordingly the only adequate balancing agent between the two. This is especially so where readily measurable high-energy conversion processes so predominate the industrial picture that the tiny remainder of converted energy represented by human muscle power is too inconsequential to warrant consideration. All residents of the Technate would be granted their individual consuming power in the form of Energy Certificates which would serve to maintain a continuous inventory and to furnish other necessary information. The details of this distributive mechanism are contained in the official Technocracy pamphlet, 'The Energy Certificate,' available at any headquarters office of the organization.

A new functional calendar is another important part of the blueprint. This would smooth out the peaks and troughs existing in most phases of Price System operation, and would put all operations and services on a 24-hour daily basis throughout every year. Because such full-load operation would considerably reduce the amount of required equipment, there would also be a marked decrease in the use of irreplaceable resources. Amongst further advantages would be the elimination of rush-hour traffic snarls, and the excessive weekend and summer-time loads thrown on recreational facilities.

To obviate the possibility of stagnation in any branch of operation, the blueprint provides that the Research Sequence shall work constantly through all other sequences, looking for new and better ways of performing jobs. It will further make sure that optimum quality is built into all commodities. Whenever improved processes are developed that will either save materials or provide more efficient productive techniques, they will be introduced by the respective sequences. The production of goods to last instead of to sell will cut down drastically on the actual necessary volume of consum-

er commodities, thereby further eliminating waste.

Housing for all citizens of the Technate area is an integral part of the blueprint. The objective will be to provide everyone with living accommodation of the most comfortable and efficient type, with ready access to numerous additional facilities to remove drudgery and to enhance living. Building specifications for the type of proposed housing have been blueprinted, and are far superior to anything existing today.

A prominent blueprint feature which has been publicized for years is the Continental Hydrology. This would link the rivers and lakes of North America with a system of canals to provide low energy cost water transportation the length and breadth of the Continent; to provide hydroelectric power transmitted at one million volts direct current for distances up to three thousand miles; and to raise the declining water-table of the Continent. The size and location of all canals are included in the blueprint, as are the specifications for the type of craft to be used and for the power lines which will transmit the high-voltage electricity.

Transportation for a Continent, taking into account both vehicles and thoroughfares, has also been planned in considerable detail. Communications of all types have been projected on a similar scale. Education, public health and recreational facilities are but a few of the many other functions included in Technocracy's blueprint of social operation for North America. All have received comparable attention.

It has been impossible to elaborate any details of the blueprint within this short space. For a fuller picture, the reader must do a little investigating of his own — either through studying Technocracy literature, attending public meetings, or, best of all, by applying for membership. By far the most thorough investigation can be made from within the organization which conducts regular classes through a comprehensive Study Course.

Little attention has been given to the advantages which would accrue from a Technate operation because these are results rather than parts of the

blueprint. It is fortunate that, through the institution of such a program, the environmental conditions on this Continent are able to provide an extremely high living standard for its total citizenry; but even if such were not the case, it would still be necessary to install a governance that is in accord with our technological environment when the Price System grinds to a halt. Technocracy's blueprint of scientific governance contains all essential ingredients for the smooth functioning of North America's social mechanism.

All North Americans should familiarize themselves with that blueprint without further delay, for it provides the only means to survival from the disastrous chaos which threatens to accompany the imminent demise of the Price System.

—Rupert N. Urquhart.

★ OTTAWA—The Canadian Lumbermen's Association has observed that the hardwood plywood industry in eastern Canada was in 'critical condition' because of large imports from Japan.

Don McGillivray, chairman of the association's hardwood veneer and plywood bureau, said a special meeting would be held to discuss methods of combating 'the danger to the industry' brought on by Japan.

'Imports of Japanese plywood into Canada have skyrocketed from practically nothing in the early 1950s to some 50 million square feet last year,' he said in a statement. He said three Canadian plants have been forced to close down and lay off employees.

'During the post-war years there has been a rapidly advancing consumer market for Canadian hardwood plywood,' he said. 'However, practically all of the increase has been met by material imported from Japan. A parallel situation exists in both Canada and the United States in that the hardwood plywood imports from Japan have almost wrecked the home industry.' **—United Press International.**

★ NEW YORK—The Russians are headed for an economy of relative abundance, predicts food processor David Levitt. He has just returned from a cultural exchange trip to the Soviet Union, where he studied food processing.

'I was impressed with the amount of modern food processing and packing the Russians are doing—in spite of the fact that their food industries have no competitive incentive to do so. In at least two fields, the handling and production of wheat, flour and beet sugar, they may be a little ahead of us,' he said.

It's relatively easy to plan an economy when everything is scarce as things have been in Russia ever since the 1917 revolution, Levitt said. 'But they are already experiencing occasional surpluses—they have a surplus of bicycles at the moment. When they achieve relative abundance, as they will at no distant date, they will face some of the problems of distribution and economic imbalance that we do,' he added. 'But I have a feeling they will solve the problems faster than most American business men imagine.' **—United Press International.**

Physics and Politics

In this reprint from THE BULLETIN OF THE ATOMIC SCIENTISTS, the author, a Nobel Prize Winner in physics in 1954, outlines the complete difference in approach to problems between physicists and politicians. The difference in results is also considerable.

PHYSICISTS in several instances have saved their science from difficult, sometimes seemingly unsolvable crises, by their ability to reverse their thinking, by making a complete about-face. The world of politics is in such a crisis, and although the questions concerned differ completely from those in physics, it should be worth while to examine the methods of thinking of this science. We physicists are, moreover, very willing to place our experience at the disposal of politics. For we are aware of the fact that the political crisis was brought about by our research, and we feel greatly responsible.

The birth of modern science itself at the close of the Middle Ages was a revolution of thinking. The rule of scholasticism which relied on authority, in particular on the philosophy of Aristotle, was replaced by independent thinking and experimenting. Copernicus reversed the ideas about the universe by introducing the heliocentric theory of the planetary system in place of the ancient geocentric model of Ptolemy. Kepler, Galileo, Newton showed that the laws governing the movements of celestial bodies were the same as those valid on earth, in complete reversal of the ancient belief that the heavens were the place of harmony and law, the sub-lunar sphere the place of disorder and strife.

From these beginnings the imposing structure of modern science developed. Many new ideas appeared and surprising discoveries were made. Brick was laid on brick, and progress proceeded in a more or less straight line. There happened, however, two events where basic concepts concerning the philosophic foundations of science turned out to be insufficient to deal with new experimental

facts, and again a complete reversal of thought was demanded. One, the theory of relativity involved new concepts of space and time; the other, quantum theory, compelled us to abandon the idea of casual determination and to introduce a new type of statistical description of natural phenomena. Both these events had deep philosophical consequences, concerning the relation of theory and observation. I mention here only the result of quantum theory, which states that it is not possible to determine all physical properties of a system simultaneously with the help of the same apparatus. The different sets of concepts and the different experimental arrangements, needed to obtain all possible information, are not contradictory, but complementary. This idea of complementarity appears to me particularly important, because it can be applied to other fields of thought. For instance, the eternal philosophical conflict over necessity and freedom of the will is thereby resolved; it is a question of two equivalent complementary aspects of the same situation.

I cannot go into greater detail. The purpose of this short exposition was to show that physics does not shy away from any revolutionary changes when the facts warrant it. The credibility of our methods of thinking is proved by successful results. This encourages us also to enter the field of politics, inasmuch as we are involved in it through the consequences of discoveries in the realm of physics.

The link between physics and politics is technology. Politics is based upon power, power on weapons, and weapons on technology. In our history books this is barely emphasized. It is made to appear as if everything depends only on the wisdom of statesmen and the bravery of soldiers. But the sharper sword, the harder shield, the faster war chariot, the bigger and better ship always played a role, often a decisive one. Without them, for example, the victory of the small Greek cities over the enormous Persian empire would have been inconceivable. There are many other examples of the importance of technical superiority in decisive historical events, particularly after the discovery of gunpowder. Most noteworthy are the

conquests of Peru and Mexico by a few hundred European adventurers. Their armor, firearms, and cannons decided the issue.

The forging of weapons was a handicraft in antiquity and in the Middle Ages. The collaboration of scholars in producing arms is reported as a curiosity, as shown for example by the story of the great mathematician and physicist Archimedes, who took part in the defense of Syracuse against the Romans by the invention of war machines and was killed during the storming of the city. In the Renaissance great minds appeared, like Leonardo da Vinci, who were at the same time artists, craftsmen, researchers, inventors, and designers of weapons. Starting with Newton a rapid development took place, in which science and technology collaborated closely in the way we know today.

Can we understand this sudden, explosive growth? Is a historical law behind this? Many historians deny that such laws exist at all; others have advanced definite theories about it. I recall Spengler, who in his once famous book, **The Decline of the Western World,** tried to prove that all civilizations run the same cycle, i.e., rise, flowering, and decline. Also the English historian Toynbee tries to show parallel developments through comparative analysis of many civilizations. Karl Marx's historical philosophy claims no periodical repetition of similar cycles, but a progressive process, which leads necessarily from the primitive existence of pre-historic man to communism by way of feudalism, capitalism, and socialism.

I consider such speculations fantastic and dangerous. The only kind of natural law which a scientist can expect in human society is the statistical one, which proceeds from the law of large numbers (of individuals). The case which interests us here is the question of how quickly something grows which reproduces itself always in the same proportion. A well-known example is compound interest. When interest is always added to capital, the increase is at first slow, then faster and faster, and finally becomes enormous according to the law of geometrical progression or of the exponential function. But this behavior can

easily be obscured in the beginning stages, when it is affected by chance fluctuations; if, for example in the case of compound interest, in the same account irregular deposits and withdrawals would be made. Progress in technology is similar. It has a tendency to grow, as each invention and improvement facilitates the next step. But as long as fluctuations predominate caused by the accidents of politics, by war, and economic strife, this growth will not be apparent. Such was the case until about 1600. Then the rise began, which became rapid from about 1800 on, and is breath-taking today. It will continue so, if a catastrophe does not put an end to everything.

As I am almost 80 years old, I have myself experienced about half of this technical period. In my youth the difference in the way of life from that of, let us say, Caesar's time, appeared prodigious; but the differences of today's existence from that of my youth are incomparably greater, so great, that an enumeration even of the most important things is impossible. I shall discuss just one.

Technology has become the decisive factor in waging war. Thus it was already in the First World War when victory in the endless battles was mainly a question of superior material. The Second World War was decidedly a struggle of machines and technological organizations, and it ended in Asia with the dropping of two atomic bombs, which had come straight out of the laboratories of the physicists. From then on we have a pushbutton war: nuclear means for mass destruction, delivered by rockets, which are guided by electronic brains—not to mention chemical and biological methods for annihilating whole populations. It is not my purpose to dwell on technical aspects. I will only say that both great powers, the United States and the Soviet Union, according to reliable estimates, have so many hydrogen bombs that each one can exterminate the population of the other not once, but 10 or 20 times, and the rest of mankind in addition. For the radioactivity released in a great nuclear war is sufficient to destroy all life on earth.

This indirect, total pushbutton warfare has nothing more in

common with earlier warfare, not only from a technological but also from an ethical standpoint.

Mankind has always suffered from plagues and catastrophes: conflagration and inundation, illness and pain, starvation and war. Since the scientific-technical revolution we have gained the upper hand over some of these. Conflagration and inundations have become rare in civilized countries and are combatted by rational methods. The Peoples' Republic of China regards it as one of her first duties to prevent the terrible floods of the big rivers.

The fight against illness and pain is being carried on with ever increasing success by medical science. In Europe and America the great killers like plague, cholera, smallpox, etc., have vanished, and many other illnesses have become harmless. In my youth a visit to the dentist, despite laughing gas, which was available even then, was a torture. Not long before that an operation without anesthetics was sheer hell. No words of gratitude can express adequately our debt to medicine.

In the world as a whole there still remains much to be done. Only about one-third of the population has enough to eat. Two-thirds are undernourished, and when we count those suffering from poor diet, lack of proteins, vitamins, etc., then we come to the shocking figure of 85 per cent. Also medicine and hygiene are completely inadequate in by far the greatest part of the populated world. To mention only one figure: the expectation of life at birth in India is about 30 years, while in Europe and the U.S. it is close to 70. Enormous tasks lie ahead of us. They are complicated by the fact that the increase of population is colossal. At the present time the world population is about 2.8 billion, and it is expected around the year 2000, that is, in 40 years, to reach 5 or even 6 billion. However, these enormous problems are recognized and are being studied. They could probably be solved, if the last and greatest plague were not present, war and the tremendous expenditures for armament. —**Max Born.**

The Shock of Technology

Technology produced its first major shock with the invention of the steam engine. Its effect has been cumulative, causing its creators to realize that they have a responsibility to determine the consequences of the machine and its social influence.

EUROPEANS have had little more than a century to adjust themselves to the shock of instantaneous communication and the shock is only now reaching millions in Africa and Asia, destroying centuries of tradition, driving society at a fresh pace.

It is not sufficient to understand the technology which causes the shock: the shock itself must be understood too.

A technological achievement does not stand by itself. It can be understood only if it is regarded in the context of its history. It stretches back through salesmanship, production, design, to the scientific work which made the achievement possible; it reaches forward into social and economic changes which follow the achievement.

Technologists in the steam age were not fully aware of this unbreakable continuity which begins as a page of mathematics in a notebook or an experiment in a laboratory and ends (if it can be said ever to end) in the happiness or despair of men and women. In the electrical age technologists have become aware of this continuity; they realize they cannot confine their interest to technology.

They know that every achievement in the electrical industry is inseparable from the science out of which it grew and the society in which it will bear fruit. A factory making electric generators, for example, cannot be understood in isolation.

Its activity begins in schools and technical colleges and university laboratories, where ideas germinate and interests are formed, and its influence can be followed after the generators are installed: into Indian villages, emancipating the people from poverty and dissolving the constraints of caste; into the minds of Africans, detribalizing them and molding their ideas into pat-

terns of the twentieth century; into the Arab world, equipping it with tools for its resurgent nationalism; into the industrial towns of Britain, creating new opportunities for employment and new conditions for family life.

It is no wonder that industry has become one of the patrons of learning. The technologist is irrevocably involved in mankind.

Of course, this is no sentimental involvement, no woolly gesture of goodwill toward boffins and sociologists. In the electrical industry it is a hard-headed recognition of two facts; the first, that technology draws its nourishment from 300 years of scientific thought; the second, that the achievements of technology change men's minds, and that it is essential that these changes should be understood.

Technology has its roots in science. Its fruits are in the lives of men and women.

For some years industry has recognized its responsibility toward research in science and mathematics, forerunners of the machine. More slowly, and with some misgivings, industry is now coming to realize that its responsibility does not end with making, installing and servicing the machine; it has some sort of responsibility—still to be defined—toward research on the consequences of the machine and its influence on society.

—The Economist, London

★ MIAMI BEACH, FLA.—A way to vaccinate men and women against conception was pointed out here by a team of physicians and scientists. The scientific evidence was given in a report at the opening of the American Medical Association's 109th annual meeting in June.

While the studies dealt with puzzling cases of infertility, the results are highly encouraging in the search for vaccination against conception, the team said. The study of 3000 men and women in New York City, Los Angeles, India and Holland established that human sperm can act as an antigen to stimulate the formation of anti-bodies that provide immunity against the same sperm, it was reported. A form of antigen-antibody reaction is believed by the researchers to be the reason why some of the couples studied are infertile. The studies may help the childless have children.

Foreseen in the future is vaccination against conception, to be undergone voluntarily by men and women, utilizing a similar reaction to that which appears to cause some types of infertility. *—Vancouver Sun*

Printing Pressures

This article from THE PRINTING REVIEW (August 1960) is reprinted here because it illustrates without need of further elaboration why the Price System on this Continent is unable to meet the challenge of foreign competition. The printers have plenty of company.

EUROPEAN printing being imported into Canada and the United States is causing very grave concern to printers in both countries.

In an article reproduced in this issue of Printing Review will be found extracts from a brief presented to the United States government by the National Association of Photo Lithographers which underlines the gravity of the situation as far as U.S. printers are concerned. Actual figures of imports of printed matter are given and the comparison of prices quoted on certain jobs by European and U.S. printers are shown. The American printers claim that the 'peril point' has been reached and they are urging their government not to lower tariffs at the forthcoming Geneva meeting, but to raise them.

This is because the U.S. government has in mind the lowering of tariffs on various printed products as well as on many items of paper and paperboard, copper engravers' plates, printing machinery (except presses), nickel sheets and plates and new printers' type.

The Canadian printing industry also has a vital stake in the tariff proposals. To the small printer who is barely eking a living out of neighbourhood business the broad international issue may not seem important. But, even apart from printing, the threat to our economy of lowering tariffs on all kinds of products is a threat to our economic future and a number of prominent persons have recently brought the matter to the forefront in public speeches as well as before parliament.

Speaking to the annual meeting of the Canadian Manufacturers Association in Toronto, Mr. J. Herbert Smith, President, Canadian General Electric Co. Ltd., said:

'The challenge to Canadian in-

dustry and Canadian workmen, from the growing volume of imported manufactured goods cannot be met until there is a full understanding, by our own people—and especially by our representatives in Ottawa and in the Provinces, that there is such a challenge — and that this challenge can in fact seriously affect the economic future of Canada itself.

'Canada has a chronic deficit balance of international payments. . . . There is a disturbingly high degree of unemployment and a decline in immigration. The cost of paying unemployment insurance to Canadians who could not find work was $900 million during the past two years and the Unemployment Insurance Fund is being depleted at an alarming rate.

'All plans for Canada's expanding prosperity have assumed that growth in manufacturing would provide jobs, incomes and higher living standards. This is not happening. Despite tremendous efforts in cost reduction, product innovations and new marketing techniques, Canadian industry is slowly losing out, product by product, to the low-wage countries. Even after concerted drives by many Canadian manufacturers to make products here that were formerly imported and to fully support 'Made-in-Canada' programs, the fact is that 78 per cent of all imports are in the area of fully manufactured goods against 67 per cent in 1947.

'However reluctant Canadian industrialists are to reach this conclusion, it is becoming clearer each day that, on a growing list of domestic products, it is not possible to offset existing foreign wage differentials with know-how and superior tools. We must face the fact that the low-wage countries also have production know-how and frequently newer and superior tools.

'The choice is becoming abundantly clear. Canada can retain its standards of living in only one way—by encouraging home production of those products where the foreign producer enjoys only one advantage; lower wages and a lower standard of living. If we choose not to do this, we must ourselves be prepared to accept lower standards of living, heavy unemployment,

and a slower rate of growth or even regression.'

This is a serious warning from a man who is in a position to evaluate the full effects of foreign competition. The Canadian printing industry is as vulnerable to this kind of competition as is any other business. Even with the present tariff structure, European printers can outbid local plants on many kinds of jobs and if our government further reduces duties on printed products the situation will become alarming. —**F. Alan Smith.**

★ THE AMERICAN SUGAR REFINING COMPANY has just moved its Boston production into a new plant believed to be the most fully automated in New England.

It will produce about as much sugar as the original 100-year-old plant, but with less than half as many workers.

Company officials declined to tell how many would be on staff when the change-over is finished in November.

But officials of Local 1616 Sugar Workers, International Longshoremen's Association, which represents most of the refinery workers, estimated an employment drop from 380 to 150.

The company will give severance pay to those not taken along in the transfer and is trying to find jobs for them in other firms. It gives them paid time off to go out for interviews.

The problem of workers displaced by machines is also before the Associated Industries of New York State. Its recent meeting was told that white collar wearers already outnumber blue collar workers. John W. Limbert of the Bureau of Employment Security of the state Department of Labor said telephone companies now regard themselves as 'strike-proof.'

'The problem,' said Mr. Limbert, 'is how to introduce these technological changes in a humane way that will treat the worker as a human being and not as a robot to be cast on the trash heap, but at the same time not to tie the employer to antiquated work rules and methods which have no contemporary economic justification and which place him at a disadvantage with foreign competition and newcomers into the field.' **—Vancouver Sun.**

★ OTTAWA—Canadians who buy on 'the instalment plan' stretched their credit farther than ever last year, a bureau of statistics report shows. Sales finance companies handled a record $1,258,203,000 in instalment credit last year, up 10.9 per cent from 1958.

Financing of consumer goods rose 3.8 per cent to $902,575,000. Sharpest increase was in sales financing of new automobiles, up 10.6 per cent to $371,392,000. The total for used cars fell 3.1 per cent to $322,746,000. Financing of all other consumer goods—radios, TV sets, furniture and the like—was up 3.7 per cent to $208,437,000. Sales financing of commercial and industrial goods rose by more than one-third to $355,628,000. **—Canadian Press.**

Australian Steel

In this release issued by the Australian High Commissioner in Ottawa, Canada, the considerable growth of the Australian iron and steel industry is outlined. It is expected that Australia will be self-sufficient in most kinds of steel by the mid 1960's.

IN the last twenty years Australia has consolidated herself as the third largest producer of iron and steel in the British Commonwealth, with the largest single steel producing group in the Commonwealth. Only the United Kingdom and Canada are larger producers, the first by substantial amounts but Canada by a not very much greater output having in mind the differences in population of these two countries — Australia with 10 million people and Canada with 17 million.

In consumption per head of steel, the best indicator of intensity of steel usage and of comparative industrialization, all three countries are very close. Each consumes on an average between 700 and 900 lb. of ingot steel (in equivalent form) each year. Whereas the United Kingdom and Australia are very largely self-sufficient in steel-making facilities, Canada relies heavily on imports from the nearby steel plants of the United States.

The remarkable growth of the Australian iron and steel industry is a reflection of the no less remarkable growth of the Australian secondary production which it supports. The leap forward on all industrial fronts, particularly in the post-war period, has placed extraordinary demands on this basic industry and there is every indication that these demands will continue.

Australia has never been in the position of having a ready source of supply close at hand and, therefore, has had to instal its own facilities to supply local needs. Not that it has always been possible for local production in Australia to match demand. So rapid has been the industrialization of Australia since 1944, so rapidly has the population grown and national income, that steel production has been

inadequate to meet peak local demands. Notwithstanding that the basic iron and steel producers in Australia have invested 180 million pounds in the past 15 years, there are still occasions on which demand exceeds supply. However, the gap is steadily being reduced as a result of the continuing expansion of the industry, and it is expected that Australia will be fully self-sufficient in almost all kinds of steel by the mid 1960's.

Indeed, by that time the nation may also have a permanent exportable surplus of many steel products. Steel demand has been rising in Australia since the war at an annual average rate of more than 6 per cent compound—one of the highest rates of expansion to be found anywhere. Endowed with good natural resources, a relatively small but rapidly growing population, and with financial resources which place Australia among the rich countries of the world, so rapid an advance as a steel user and producer is hardly surprising. When Australia's distance from the main centres of iron and steel production is also taken into account, there is a further imperative towards steel production.

At present rates of expansion and having in mind what is expected of the Australian economy during the 1960's, there may well be a further doubling of steel production and possibly of consumption by 1970. At present Australia produces rather more than 3.5 million ingot tons of steel a year. This is expected to rise to 4 million tons by 1961 and to between 6 and 7 million tons by 1970. **—Clive Turnbull.**

★ ALTUS,OKLAHOMA—They are saying '10-4' in the Oklahoma cotton patches these days. Two-way radio makes the police jargon possible and is a valuable factor in the fiber farming business. 'The radio doesn't pick cotton but it saves about 100 miles of travel each day,' said Wayne Winsett, who operates a 1,900-acre cotton plantation.

Mr. Winsett's cotton fields cover a wide area surrounding this southwestern Oklahoma city which will be a major Atlas missile launching base. Electronics is a common subject of discussion in the area. This prompted Mr. Winsett and two of his farmer friends to install the system which sends their voice over a twenty-five-mile radius.

The farmers use the radio to issue orders to workers in their scattered cotton fields, order parts for machinery, command aerial spraying and direct many other operations. The radios are installed in eight pick-up trucks. **—U.P. International.**

Science Shows the Way

The shining discoveries of our technologists and scientists contrast sharply with the worried wallowings of our politicians. How the benefits of the first are largely nullified by the actions of the second are reviewed here by the VANCOUVER PROVINCE business editor.

THE technologists and the scientists certainly appear to be holding up their end of things. But the same can hardly be said for the economist and the politicians.

To mind come a number of remarkable technical and scientific 'breakthroughs,' as they call them, of recent date. Their shining discoveries are in sharp contrast to the worrying, wallowing economic status of the nation at the moment.

Consider that a 108-mile steel pipeline now carries crushed coal from the strip mines of eastern Ohio to the thermal power station of Cleveland Illuminating Co. The success of this experiment, we learned recently, is reflected in plans now being made to connect Pittsburgh with New York City with a similar pipeline! Also under consideration is a coal pipeline (the coal moves in a slurry which is about 50 per cent coal, 50 per cent water) from Pittsburgh to Detroit, Utah to Los Angeles.

A recent bulletin from the Japanese Embassy in Ottawa tells us of several exciting breakthroughs by our population-pressed trans-ocean neighbors.

The Japanese, lo and behold, in what they call an 'ichthyological breakthrough,' have created a new variety of fish by cross-breeding male ocean salmon with a fresh water trout. Thus the Japanese foresee the day when they may create a bigger and tastier species of fish and raise it in fresh water, perhaps eliminating the many complications they face with Russia, the U.S. and Canada about national fishing rights.

Also developed by the Japanese in recent days is a new apparatus to convert sea water into fresh water, which has drawn international attention, and a new 'direct production method' which uses powdered iron ore

to make steel—eliminating the intermediary step of first making pig iron from the ore.

We've written here before about the experiments in liquefying natural gas for transport in special ocean steamers, a technique which could enormously expand world markets for natural gas.

Canada itself is pressing research into a method to use its massive uranium surpluses to harden steel; the engineers now have working models of fuel cells and non-reciprocating gasoline engines, each with tremendously increased efficiency.

Our present method of refrigerating should soon become obsolete, replaced by a new scientific phenomenon, and so on . . .

One would think that such imagination, resourcefulness and ingenuity would assure increasing, unbroken prosperity for all peoples.

But, in fact, we face a winter in Canada marred by the prospect of 700,000 unemployed; the economists tell us things probably won't pick up until 1962; the politicians assure us the last half of the '60's will be boom years.

In the meantime, we appear to be in the grip of one of those all too familiar artificial—in the sense that they are man-made—economic cycles.

The economists, of course, can plead, with considerable validity, that theirs is far less exact science than that of the engineers and scientists. They could also—with doubtless even greater validity—argue that the best laid plans 'of mice and men gang aft a-gley,' as far as they are concerned, because political decisions and policies counteract or render useless the economist's efforts.

How does one defend the politician in this context? It's exceedingly difficult to do.

His decision—often arbitrary, often made on the basis of pure political considerations, and often not made at all—takes precedence and can nullify the best efforts of others.

And perhaps it is in the politician—as opposed to the statesman, of course — that we find the greatest economic weakness, human indecision and frailty.

And when the shoe fits . . .

—Wm. E. Ryan

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer mechanic, teacher, preacher or house wife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

. . . . . IS A SOUNDLY SCIENTIFIC EFFORT TO RESTATE ECONOMICS ON A PURELY PHYSICAL BASIS.'

—H. G. WELLS

TECHNOCRACY DIGEST

FEB. '61

Economy of Planned Waste

The Peril of Panic

Organ Transplants

New Metric Standard

Highway Snow Remover

Microwave Leaps Ahead

Let's Measure Up!

Age of Adjustment

No. 179

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TECHNOCRACY DIGEST

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The Quarterly Survey

Happy (??) New Year

'NEW YORK (AP) — Efforts to give the United States economy a lift became the key note as 1961 opened. There seemed to be general confidence that business and government, working together, would get things on an even keel before the year is over.'

This January 7th announcement by Associated Press expresses a hope widely held by Price System business, but, in many quarters, with little expectation of being realized. The customary good wishes that welcome the advent of a New Year were accompanied January 1st, 1961, by numerous—if unspoken—doubts as to what the year would actually bring. The outlook is not as bright as the above AP report would indicate, even taken in the light of a prior AP release from New York made on Christmas Eve, 1960:

'Christmas brought only moderate cheer to American business men this year. They are toting up the generally disappointing results of a year that was supposed to be the springboard for the 'soaring sixties.'

'Merchants struggled this week to push Christmas sales to at least equal to 1959, a record season. The National Retail Merchants' Association said storekeepers would happily settle for last year's volume. Their hopes of a new record were belted by blizzardy weather and, the NRMA said, the customers' caution in spending money.

'There was another increase in the cost of living. The steel and automobile industries curtailed production. Steel plants were shy of orders and the automakers had placed a big inventory in dealers' hands. Steel output sagged to 46.9 per cent of capacity, the lowest tonnage produced in a non-strike week since the 1930's.

'The United States continued to spend more abroad than it received. The commerce department reported the deficit in the third quarter totalled $1,152 mil-

lion, equalling an annual rate of $4,100 million.

A month earlier the New York Times observed that President-elect John F. Kennedy would face some serious economic problems on taking office.

'First and foremost,' stated the Times, 'unless the present indications are wrong, he will be be faced with an incipient or a full - fledged business recession. He also will be faced with an unfavorable balance of payments, resulting in an outward flow of gold and other funds from this country. He will be faced with the apparently never-ending threat of inflation and the task of maintaining 'full employment' or something close to it.

'These are just some of the economic headaches that await the incoming occupant of the White House. The business situation right now is far from clear-cut, although there are definite signs of an economic downturn.'

Et Tu, Canada?

Not all the worries on 1961 prospects are south of the 49th degree. Canada has its full per capita share. Looming large amongst many other causes of concern is the growth of unemployment and the resulting rapid decline in the unemployment insurance fund. Reporting from Ottawa, on December 22, 1960, the Canadian Press observes:

'The unemployment insurance fund — providing benefits to jobless people — will possibly plunge to $85 million by next May 31, the government has been warned in a special report from an advisory committee.

'The report of the nine-man Unemployment Insurance Advisory Committee was tabled in the Commons.

'It repeated the committee's warning of last summer that the fund is below a safe level and urgently urged the government to replenish some $131 million paid out as extra seasonal benefits. The report also reiterated a proposal that the government boost its contribution to the fund to equal half of the combined employee-employer contribution.

'It said: "By the end of May, 1961, the fund will possibly be as low as $85 million and certainly at a most unsafe level."

In 1956 the fund contained more than $900 million.

Spermal Spiral

It is expected that before the end of 1961, the world population figure will pass the three billions mark, thus further substantiating Technocracy's observation of a few years ago that a more explosive global situation than the fission of the atom promises to be the unrestricted fusion of the sperm and the ovum. The United Nations' statistical office's Demographic Yearbook has recently released the following corroborating information on the world population explosion:

As far as the UN is concerned the following statistics may one day mean the difference between life and death — life because world agriculture was ready, slow death by mass starvation because it wasn't.

In an hour, the world's population increases by 5,000. In a year it adds to its 2,900,000,000 population a number equivalent to the population of Italy—between 48 million and 49 million. About 100 million are born and slightly more than 51 million die.

All this according to the UN statistical office's Demographic Yearbook.

The population of mainland China, according to the yearbook, is the largest of any country in the world — 669 million. India follows with 403 million; the Soviet Union with 209 million; and the United States with 178 million, including the new states of Hawaii and Alaska.

Next are Japan with 92 million, and Pakistan, Indonesia, Brazil, the Federal Republic of Germany, and the United Kingdom, all with populations in excess of 50 million.

If population eventually means power — and history would indicate that this is so— a prophet, grade II, could tell you that the world will soon be run from Asia. Over half the world's population is now Asian.

Of the countries which do not fall into these high density categories, the Netherlands has the highest rate (more than 860 per square mile) with Belgium, England and Wales, and Japan in a scramble for second place.

Canada, along with Australia and Iceland, is sparsely populated by world standards.

The Economy of Planned Waste

The author of the book reviewed here is a keen analyst who sees clearly most dangers besetting this Continent. However, he cannot face 'so drastic' a solution as Technocracy—the only positive answer to the dilemma he poses.

(Book Review: 'THE WASTE MAKERS' by Vance Packard, 1960. Published by David McKay Company, New York. $4.40.)

VANCE PACKARD, the author, is an American-born citizen, having been born, reared and educated in the northeastern United States, where he still resides. His early career was that of reporter and writer for newspapers and magazines. Lately, he has devoted himself to writing critical books on American economic and social life. Although regarded as controversial, his three books, to date, have made the 'best-seller' list. Prior to **The Waste Makers,** he wrote The **Hidden Persuaders and The Status Seekers.** It is our purpose here to present a review and analysis of **The Waste Makers.**

The broad fact that America's economy is one of planned waste is nothing new to any alert American who has made an elementary study of our way of life; and it is 'old stuff' to Technocrats. Stuart Chase, in his first and best book, **The Tragedy of Waste,** wrote about it in the early 1920's while he was associated with The Technical Alliance, the forerunner of Technocracy Inc. The distinctive feature of **The Waste Makers** is the up-to-date compilation of data and techniques relating to the subject of planned waste by American business.

Waste has become an intrinsic feature of the American economy. Although the prime perpetrators of waste are the businessmen who are seeking a higher volume of sales, they are not the only guilty ones; for, almost everyone in America, in some way, has an economic stake in continuing the waste. The faster things are made to deteriorate, the greater the volume of production and handling, the more jobs there are, and the larger is the number of moochers that can be carried by the economy.

If you happen to wince at the idea of planned waste as a way of life, think for a moment of the economic panic that would ensue if, beginning tomorrow, all goods were produced for maximum usefulness and durability if frequent and drastic style changes were discontinued, if employees all gave fulltime attention to their jobs instead of 'goofing off' so much, if standardization replaced variety and duplication, if supernumerary employees were released. Under this system, it would result in the greatest economic depression known to man. The Price System requires waste regardless of the ideology under which it operates—be it capitalism, communism, fascism, or democracy.

The American economy is approaching that situation which is most alarming and embarrassing to producers and salesmen, saturation. When there are more automobiles than families in the country, when there are nearly as many TV sets and nearly as many refrigerators as there are families, and when everything else from men's suits to bathtubs are in oversupply, how can one induce the customers to keep buying more? — even assuming that they had the money?

The answer to that is rapid obsolescence and early replacement of the things now in use. In other words, the consumers must be persuaded to discard that which they already have and buy something new to replace it. After that is accomplished, the next step is to induce them to buy two of everything.

The national emphasis is on growth. The precise reason for this is obscure. Sometimes it is disguised as a patriotic 'need' to outproduce the Russians. But it filters out as a desire on the part of business to sell more goods But, with saturation having already arrived in many lines, the problem of creating a desire to buy and buy is getting continuously more difficult.

Packard illustrates the credo of American retail business with this quote from Victor Lebow, marketing consultant: 'Our enormously productive economy . . demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfactions, our ego satisfactions, in consumption. . .

We need things consumed, burned up, worn out, replaced, and discarded at an ever increasing rate.'

The sad part of the whole affair is that the consumers are willing partners in this program of planned waste; hence, they can't very well cry 'rape' when they so readily give their consent.

In Part II of the book, Packard elaborates on nine strategies employed by business enterprise to increase consumer purchases:

(1) Train people to become economic gluttons. Get them to buy more of everything — extra eye glasses, extra swim suits, extra automobiles — to own two houses — to update and upgrade their possessions.

(2) Develop the throwaway spirit. Persuade the people not to keep 'old' things around — 'keep yourself fresh and bright with **new** things.' Get them to use throwaway containers; provide them with frozen food in disposable cooking pans and serving trays; get them to drain off their 'old' lubricating oil, and to discard 'used' clothing. Business does everything it can to facilitate the throwaway spirit; it makes it easy for the consumer to dispose of his goods and difficult to use them again or repair them. The biggest waste item is non-reusable packaging. The average American family pays some $500 per year for containers and packaging which are intended to be thrown away as soon as the contents are removed.

(3) Plan the early obsolescence of consumer goods. 'Durable goods' are often designed so as to barely last through the installment payments. 'The recent fascination of many businessmen with planned obsolescence' has been one of the major developments of the pastwar period.' Obsolescence may be achieved in various ways. One is by producing a functionally superior item; this is a laudable, but is all too rarely practiced. The more common way is the production of shoddy goods which break down or wear out at an early — usually predetermined—time. This practice is greeted with enthusiasm by business enterprise. Packard devotes a separate chapter to the 'accelerating trend away from durability in household appliances.

(4) Create psychological obsolescence. Another device used by business is the planned obsolescence of desirability. This may be effected through conspicuous style changes, for example. A premium of desirability is placed on the latest styles or simply on **new** things. The person who wears 'old' clothes, drives an 'old' car, or lives in an 'old' house (particularly one with 'old' furniture) is made to feel inferior; he is marked with social contempt and disdain—he is an outcast, a 'has been.' An extra chapter is given to the problem of 'How to Outmode a $4,000 Vehicle in Two Years.'

(5) Create more need for repair services. Repairing of cars, appliances, furniture, and other possessions is growing into big business. Many sales and service companies expect to make greater profits from their repair services than from their sales. Needed repairs are becoming more frequent and the cost is going up. When the consumer buys a piece of 'modern' equipment he 'should expect things to go wrong with it.' All the 'added features' which are being promoted for cars and appliances lately add to the repairman's delight—they mean that there are more things that can go wrong. To contribute to this form of business expansion, manufacturers are cooperating by making things so that it is virtually impossible for the householder to do his own repair work. First, it is made difficult for him to get at the part that needs repair. Second, it is almost impossible for him to obtain replacement parts. And, thirdly, the manufacturers fail to supply repair information with the equipment; the buyer is simply told to take it back to his dealer for service and repair when it fails to function properly. Then he learns that the dealer is unable to replace small parts; it is now 'necessary' to replace whole assemblies—at fantastic cost. And the 'old' assembly must be turned in so that it can't be broken down for future spare parts.

(6) Promote planned chaos. The merchants often make the most profits from 'bargains.' Bargain day not only creates an urge to splurge on the part of the buyers but they make it easier for the merchant to obfuscate values. The sadistic con-

sumer is so eager to take advantage of the 'distressed' merchant that he fails to note how the merchant is taking advantage of him (or her). Part of this planned chaos is achieved through published price lists, 'advertised prices,' and manufacturers suggested prices printed on the items. These are only advertising tricks used to confuse the consumers as to the value of the goods and to make him think he is getting a bargain when he buys 'below list.' Another phase of planned chaos is achieved through giving things confusing labels. For example, the word 'Jumbo' may be used to designate the small size, 'Super Deluxe' may be used to designate second grade (automobile tire, for instance). Grade labels may have no relationship to the quality of the product. Another device is to coyly offer something for sale at a 'low introductory price' and imply that the price to the general public, later on, will be much higher.

(7) Sell on credit. Selling on the installment plan is easier than selling for cash; the customer puts up less resistance if he feels that he can pay for his purchase on some 'easy payment plan.' The buyer is seldom aware of the interest rate he pays on his credit purchases; it is purposely obscured for him. For example, when he buys on Sear's 'easy credit plan,' he pays 18 per cent interest, which is 'only 1.5 per cent per month on the unpaid balance.' When a family buys a new ranch-type home for $20,000, with a small down payment and a 30-year mortgage, the total payments will add to nearly $40,000 — not counting taxes, heating and utilities, repairs, furnishings renovations, landscaping, of course. And the eventual owner will be stuck with an 'old house' which has low resell value, and which is too big and too costly to maintain for an old couple to live in after retirement. Many companies are reluctant to sell for cash, much preferring credit sales; for, often, they make more from handling the charge account than they do from the sale of the goods themselves.

(8) Promote hedonism for the masses. Much advertising is directed toward enticing people to indulge themselves, to enjoy living through the purchase of new

possessions—'get a new hat for Easter;' 'there's nothing like a new car to enrich your family life.' The public is showered with hints that happiness and contentment in life can come only from owning certain possessions. Further, you can bring happiness to others, and convey your sentiments to them, through the giving of material gifts—new merchandise, of course. There are special days in the year — Valentine's, Easter, Mother's Day, birthdays, graduation day, Christmas—all set up as occasions for buying nice things for yourself and as gifts for others. 'Buy things and enjoy life!' . . . A great deal of advertising and display is directed toward the stimulation of impulse buying—creating a desire for something on the spot.

(9) Encourage population expansion. 'More people mean more customers!' So business does all it can to stimulate the population explosion — 'babies, babies, and more babies' is one of the joyous chants of business promotions. To the businessman, more people mean more houses to be built and sold (and furnished), more automobiles, more gadgets and appliances, more clothes, and more impulse buying. It also means more special events, such as christenings, graduations, anniversaries, weddings, baby showers, etc., that call for added expenditures for items that business is eager to sell. Although the United States now has one of the highest rates of population increase in the world, the cry of business is for still more babies. When someone challenge's this premise of business enterprise with the remark the world's most populated places are also the most poverty-stricken, he is quickly given the brush-off.

Part III of the book deals with some of the implications of forced selling and buying in America. First, we are reminded of some of the penalties we must pay for all this commercialization of the American Way of Life.

One of these penalties is the unfavorable impression we make on the other people of the world. Nothing that we can say or do to the contrary 'offsets the impression that we must be a wasteful, swaggering, insensitive people.' Our swarms of 'fat, gleaming automobiles' is the primary fac-

tor in the creation of this impression. Our emphasis on appetite stimulation, dieting, and worry about over-weight can produce no other impression than that we are a nation of human hogs.

As American production becomes more costly and wasteful, it opens the door to foreign imports, which mean less production and fewer sales of American produce. Foreign imports often are winning American customers simply by being better in quality, function, and durability or by being cheaper in price.

Another penalty is the trend toward huge business oligarchies which have the resources to conduct intensive advertising and marketing campaigns to get the consumer's dollar; small businesses, not being able to meet the competition, are squeezed out.

The growing urban sprawl of Suburbia and the 'progress' toward a hundred million passenger automobiles and the roadways to accommodate them are gobbling up the open spaces. Farmland is going out of cultivation for 'developments' and highways at the rate of more than 3,000 acres per day. Woodlands and beaches are being overrun and are disappearing from the cene. In many localities, a housing lot with a 'view' may command several thousand dollars in premium value. A combination of increasing population and low-density residential sprawl is closing in on us and depriving us of much of our freedom of movement. Rivers, lakes, and beaches are becoming polluted to a dangerous degree. People are getting in each other's way. And the new generation is conditioned to greater and faster mobility than any generation before it. The trend is toward social chaos.

Another price that Americans are paying is the rapid depletion of their natural resources. An American family consumes, outside of food, some ten to a hundred times the quantity of raw materials that most of the world's families consume. Only in America would a housewife jump into a two-ton, 300-horsepower machine to run down town to make a ten cent purchase. Only in America does the average family throw away some 750 metal cans a year. Only in America does a family burn thouands of gallons

of oil each year to heat a house. But the well of resources is running dry. Already, the United States must turn to outside sources for from 25 to 100 per cent of various essential raw materials. We are becoming increasingly more vulnerable in the world; more so, since we make a big display of our economic gluttony to hundreds of millions of people whose major problem is one of bare survival, while at the same time we grab away their resources to feed our own gluttony. Even fresh water is becoming a serious resource problem in many parts of our country.

There is much talk of substituting plastics for metals and atomic energy for fossil fuel energy, and of desalting the sea to provide fresh water. While some progress may be made in these directions, the answer is not yet in sight. Everything indicates that the period of high, wide, and handsome living in America is rapidly drawing to a close.

In spite of the pessimistic outlook from the materials point of view, business goes merrily on pressing for more sales, more consumption, more waste. We are living in an age of high-pressure commercialism. Business is expecting to spend some $25 billion annually by the mid-sixties just to create artificial want and discontent among the consumers. Already, on numerous occasions, broadcasting companies are packing six or more commercial advertisements into a fifteen minute program. The harassment of the public by advertisers and salesmen penetrates every facet of our living, sometimes in ludicrous manners; for example, as when an appeal is made on television to help feed hungry children in some foreign land and it is followed by a dog-food commercial extolling the tastiness of a certain brand, which is sure to tempt the appetite of any pampered pooch. The advertisements in Sunday papers are becoming so bulky that one can hardly carry the paper home anymore. Billboard advertising has long been recognized as a national disgrace; likewise, the numerous display signs along the streets of our cities. Now there are plans being considered to project giant advertisements onto clouds in the sky and even of filling the sky with artificial

clouds for this purpose when the sky is otherwise clear. We find people returning to the movie theaters to escape the commercials on television and finding that the movie screens are now being used for commercial advertisement.

Another consequence of our over-emphasis on commercialization is a change in the character of the American people. They are becoming more greedy, self-centered, and hedonistic in their outlook. They have become obsessed with a desire for material possessions. Fewer of them—fewer than anywhere else in the world—are interested in social ideals or in helping others beyond the limits of their own families. The average American is developing the smug attitude that the world owes him a living; not only that, but a very good living. And he is not at all concerned about those who must suffer privations to provide him that very good living. In other words, he is developing a bourgeois attitude.

A further consequence of this mania for 'living it up' is the condition of being 'strapped for money' which is the prevailing chronic condition of the majority of American families. Going into debt has become fashionable and easy. In order to meet the payments, the husband often takes on two jobs; and the wife may get a job too. At present, there are more married women than single women working at paying jobs. (A Philadelphia burglar, recently apprehended, explained that he robbed only old houses, since people living in new houses seldom had enough valuables laying around to make it worth while.) During recent periods of recession, shoplifting took big jumps upward, especially shoplifting in super-markets. Stealing was preferable to curtailing living patterns.

Part IV, which offers some suggested courses for easing the situation, is the weakest part of Vance Packard's book. The author is either unwilling or unable to conceive of a major social change — of a society in which commercialism has been eliminated — where simple distribution has supplanted exchange.

His first suggestion is that the consumer become more prudent in his purchases. He hints that the government should establish

an office, perhaps with Cabinet rank, to look after the welfare of the consumer and advise him on his purchases. The author points out that overt fraud is no longer considered sporting in business circles; hence, various agencies — Better Business Bureau, Federal Trade Commission —have been set up to prevent business becoming embarrassed by too many disclosures of fraud. 'On the other hand, marketers in general have been subjecting the consumer to a barrage of selling strategies that has rarely heretofore been matched in variety, intensity, or ingenuity. Millions of consumers are manipulated, razzle-dazzled, indoctrinated, mood-conditioned, and flimflammed.' 'In this unequal relationship between marketer and buyer, it should be added, the federal government — which is supposed "promote the general welfare"— has in recent years offered more comfort and aid to the marketer than to the consumer.'

A second suggestion is that standards of quality be set up and that goods be labeled as to these quality standards. Just how this is to be done is not made very clear, but it is indicated that its implementation would involve government, business enterprise, and the consumer. The consumer must learn to demand quality products. The government must set the standards and enforce proper labeling. Manufacturers might be induced to return to pride in quality production. But he notes that business now fights furiously against any imposed standard of quality. Among other things, business fears that the consumer may get smarter in making his purchases, buying according to specifications rather than according to trade name or advertised 'selling points.' Shoddy merchandise would lose out on the sales counter if it has to be labeled as to its true quality; or it would have to be sold at greatly reduced prices. Such standards of quality, admittedly, would NOT be in the best interest of the waste makers.

The next suggestion is that the economy be brought into balance; that production and use be gauged to need; that scrapped materials be salvaged for re-use; that the population be brought under control; that the work be spread over the whole labor force; that industry turn from

mere style changes to real innovations, creating new industries to provide employment and turn out new things for sale; and that more people turn to services for their employment rather than to production. The elaboration on these points which the author offers clearly denies the probability that they will receive any practical application under the present system. But nowhere does he suggest that the system itself be changed.

The author then moves on to what he considers a more significant suggestion: that we change our system of priorities so as to place less emphasis on production and consumption of merchandise and place more emphasis on improving the environment, to make living for the people easier and more pleasant. Where, he asks, can a citizen in an urban area find a place to relax comfortably today without spending a lot of money.

Various challenges face us. Among these are the blights on the landscape — urban blight, suburban blight, rural blight, polluted streams, wasted lands. Then, there is a great need for education that is within the reach of the entire population; college education is beyond the means of most families today. The need for improved health facilities and service is tremendous. Old folks, those over sixty-five, are in need of social aid and attention.

Then that nasty question arises, 'How is all this to be paid for?' The author's only answer is 'more taxes.' However, he does advise that these taxes be extracted through the painless form of withholding procedures, not be painfully taken from the citizen after he has received his income.

In the final chapter, Packard hints that Americans must change their style of living. Their obsession with material goods and expensive pastimes should give way to simpler and less expensive ways of enjoying life. He admits that the younger generation has not learned to live inexpensively and, moreover, that it is not likely to change readily. He suggests that people spend more time reading good books, noting that not more than one adult in three hundred reads serious books on his own initiative; that in the majority of counties in the United States, not a single copy of many serious

books of recent publication is to be found. He also suggests that television be cleansed of its commercialism so that it might provide a more pleasant and more educational pastime for the mass of Americans.

The last suggestion, insofar as the individual is concerned, is that one should 'return', at least occasionally, to the 'simple life' of a bygone era, with its casual inexpensive satisfactions. And on that note Packard ends the book.

It is quite obvious that Mr. Packard is quite satisfied with the Price System as a whole; but there are certain features of it that annoy him—at least, appear to annoy him when he is writing best-sellers. Lacking a vision of fundamental social change and of the way of life that it would bring, he appears somewhat frightened at what might happen as we gallop headlong on our present course. In this respect, he resembles Norbert Wiener, 'father' of cybernetics, who sometimes worries about having released a monster on the world. Adaptation to technological change is more than either of these men can comprehend fully; they suffer a mental block when faced with anything 'so drastic' as Technocracy. Yet, Technocracy is, and can be, the only positive answer to the dilemma that Packard poses. He is a keen analyst and he sees quite clearly most of the major dangers that beset us; as, for example, when he poses the question, will the hungry millions in the world stand humbly by while a mere six per cent of the world's population lavishly squanders more than fifty per cent of the world's resources on its own quest for hedonistic pleasures? However, his answer to that question is pathetic — conceptually sterile.

In spite of its limitations, some of which no doubt are intentional, the book as a whole is very much worthwhile as a description, documentation, and analysis of a certain aspect of American life. We advise that you read it.

Wilton Ivie, CHQ.

★ TOKYO—The amount of radioactive contamination in food and human bodies resulting from fallout has increased despite the suspension of nuclear arms tests, a Tokyo University professor states. Amounts of strontium-90 deposited in human bones increased five times in the same period, Hiyama said. **—United Press Intern'l.**

The Peril of Panic

A major threat to our industrial society lies in the uncertainty of how North Americans will react to the growing problem of unemployment within the Price System. Panic must be averted if human life and civilization are to continue on this Continent.

A PRANKSTER loosened a light bulb. To see what had happened, someone lighted a match. Fire from the match ignited a palm frond, then spread quickly to some highly inflammable decorations. Thus started Boston's disastrous Coconut Grove dance hall fire which in 1942 claimed 491 lives and injured scores more.

After the blaze had been brought under control and it was possible to determine the reasons for the extremely high casualty rate, firemen who entered the ruins found bodies piled four and five deep in front of doorways. Not all had died from the flames. Some had been trampled to death in the frenzied stampede to reach exits, while others were simply smothered by those above them. Investigations showed that most casualties were entirely unnecessary—having resulted from sheer panic.

Panic has been responsible for countless deaths and injuries throughout human history. This overpowering, often groundless, fear occurs in instances when some incident so disturbs the established routine of life that temporary mental blocks disrupt the thinking processes of those affected. Their first response, then, is to the inborn instinct for survival rather than to intelligence — frequently with tragic results. The causes of panic seem to have been endless.

On a Sunday evening in 1938, many radios in United States and Canada were tuned to a certain network as a 'newscaster' was reporting the landing of mysterious spacecraft on a New Jersey farm. Soon, as the report of the landing unfolded, more and more listeners became convinced this planet had been invaded by superior beings from outer space. Many fled their homes with such few belongings as they could quickly muster,

some committed suicide, while still others indulged in a variety of irrational acts which clearly showed the effects of panic. Had they simply taken the trouble to check other stations they would have learned that what they had heard was a play. It was, in fact, a radio dramatization of H. G. Wells' book 'The War of the Worlds.' Such behaviour, however, is a characteristic manifestation of panic patterns.

The 1929 stock market crash produced numerous examples of panicky behaviour. Only a few days before the bottom dropped out of an exceptionally successful Price System era, a prominent citizen proclaimed that the United States had 'reached a permanently high level of prosperity.' Since he confirmed the general feelings of the day, most people were totally unprepared when stock prices took their October nose-dive. Suddenly aware of the threat to their security, they reverted to primeval instincts rather than to intelligent appraisal of the situation. Panic overwhelmed them.

We are more interested here in the human reactions to the market crash than in its economic causes. Bedlam reigned during the week from October 23rd to 29th (Black Tuesday—described as the biggest and blackest day in Wall Street history) as stockholders tried desperately to dispose of their shares. In hundreds of brokerage offices men clustered around tickers watching their fortunes being wiped out. Many jumped out of skyscraper windows; others shot themselves More significant, perhaps, than these personal tragedies was the decision of millions of citizens across the Continent to withdraw their cash holdings from bank accounts. The resulting heavy run forced closure of numerous banks, doubtlessly thus intensifying the immediate effects of the crash.

Panic has seldom affected large areas or populations because stimuli are rarely severe enough to have so general an effect. The cited cases, however, clearly show that they can and do occur. This possibility holds a considerable danger for the people of this land area. Should something happen to precipitate panic on a major Continental basis, it could completely disrupt those physical operations

upon which depends the lives of most North Americans. The social peril of widespread panic therefore has the most serious implications.

Our Price System economy presents the greatest threat of a major panic-arousing stimulus. Proving progressively more incapable of distributing the abundance being thrust upon it, this scarcity-control mechanism is showing advanced signs of deterioration. What will happen as ever-growing numbers of citizens can no longer sell their man-hours in return for the dollars which represent their sole present means of livelihood? As lay-offs steadily increase in industry, the question of possible public reaction must be soberly considered.

North America's industrial mechanism is the most complex in the world, and therefore also the most tenuous. All parts are so interrelated and interdependdent—even within the Price System—that damage to or shut-down of any part has a chain-reaction effect upon the others. The physical equipment which produces, transports, distributes, communicates and otherwise provides vital services is an entity quite separate from the dispensable financial superstructure overriding it. Much of the peril of panic rests in the possible failure of those so stricken to recognize this important distinction.

It cannot be emphasized too strongly that North Americans' welfare is inextricably linked to the continuous operation of the installed technology. By chance more than by plan, a vast array of technology has developed on this Continent—especially north of the Rio Grande. Because it was devised primarily to serve business rather than the needs of society, this technology which receives its energy usually from far distant sources 'growed like Topsy' from innumerable starting points. Consequently, it is far short of the possible and desirable; but inevitably, because of the growing needs of business which were generously abetted by the land area's resource riches, the separate entities, grew together to become welded into a unit. North Americans have become increasingly dependent upon that technology in direct proportion to its growth.

(*Continued on Page* 31)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

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Organ Transplants

THE TRANSPLANTATION of tissues, and even entire organs, constitutes one of the most promising as well as the most frustrating problems in modern surgery. The art of transplanting tissue, such as skin, from one part to another in the same individual is, in fact, a rather simple procedure, the graft usually healing rapidly. Similarly an entire organ, such as a kidney, can be transplanted from one identical twin to another.

Surgical techniques have, indeed, developed to such a high degree that they are equal to the task of successfully transplanting whole organs from one animal to another. In fact, kidneys, hearts and even heads of dogs have been transplanted from one dog to another and have functioned normally for a time. However, such transplants live only a short time—a matter of two weeks or so.

EACH ANIMAL UNIQUE

The reason, it has been found, is that each individual, animal or man, is a distinctly unique entity. All the body cells and tissues

carry a distinct, individualistic immunological pattern. These patterns show the same variability and specificity as fingerprints, and could serve equally well to identify their owners. These differences between immunological patterns are too subtle to be demonstrated by any known chemical means, but they are readily recognized by the extremely sensitive immunity apparatus.

If, therefore, a foreign immunity pattern is introduced with grafted tissue, it is immediately recognized as an invader. It elicits an immunity reaction which mobilizes the body's defense mechanism to produce antibodies that soon destroy the foreign intruder. After about two weeks the graft dies and is sloughed off.

Only genetically close relatives, such as identical twins, developed from one original egg, or mice of the same highly inbred strain, carry sufficiently similar immunological patterns to accept each other's tissues.

It is this uniqueness of the immunological pattern that stands in the way of transplanting healthy substitutes for damaged tissues and organs. If this obstacle could be removed, it would lead to one of the greatest triumphs of medicine.

Two pioneer investigators in the field who have opened the way to overcome this major obstacle were awarded the Nobel Prize in Medicine and Physiology recently. The winners were Sir Macfarlane Burnet of Melbourne University, Australia, and Dr. Peter Brian Medawar of University College in London. They were honored for epoch-making studies and experiments in which they demonstrated that the 'immunity barrier' can be broken by inducing in animals an 'acquired immunological tolerance,' which gives them the ability to accept an organ from a non-related individual under certain conditions.

IMMUNITY ABSENT IN EMBRYO

In his studies, begun in 1949, Sir Macfarlane came to the conclusion that the faculty of developing immunity is absent in the embryo and that full immunological maturity is reached only sometime after birth. This meant that the 'self-recognition' capacity is not in-

herited but is gradually acquired during embryonic life. Being constantly exposed to 'self' substance, the developing immunity-producing system learns to recognize the pattern and stores a 'memory' of it for the duration of life.

On the basis of these conclusions, Sir Macfarlane predicted that a foreign pattern, introduced during the formative embryonic period, would in a similar fashion be stored up in 'memory,' so that, if reintroduced at a later stage in life, it would be accepted as 'self' and therefore tolerated by the immunity-producing system.

THEORY TESTED

Sir Macfarlane's thesis was experimentally tested and confirmed by Dr. Medawar and his co-workers. Mouse embryos, in the womb, were inoculated with tissue from a different breed of mice. The animals thus treated appeared healthy at birth and developed normally. When, later, tissue from the same breed as the original donors was grafted, the majority of the treated mice accepted the grafts, whereas non treated animals regularly rejected them. The prenatal treatment had produced 'acquired immunological tolerance.'

Tissues from breeds other than the original donors were rejected in the usual way. As expected, 'tolerance' proved to be as strictly specific a phenomenon as immunity.

The discovery of the tolerance phenomenon was described in the citation for the Nobel award as representing 'a major breakthrough in the field of immunology' and as having opened 'a new chapter in experimental biology, with several problems of great practical medical importance laid open to attack.' New aspects are emerging, the citation added, 'on the causes and treatment of the large group of disorders in which normal immunity reactions represent an obstacle rather than a help, or where abnormal reactions are at the root of the troubles.'

Questions to which answers are emerging as the result of the breaking of the 'immunity barrier', it was stated, are those of the treatment of certain radiation injuries, leukemia, and allergic disorders. Further research in this field is expected to lead to better

understanding and treatment of some diseases now believed to result from the body's immunologic attack on its own tissues, and of allergic conditions in which the body attacks a foreign invader too vigorously.

Since the testing of the basic theory, it has been found that X-rays and cortisone can serve to overcome the immunity barrier to foreign tissue in an adult animal that had not received prenatal treatment. This method was used recently at the Harvard Medical School in a successful kidney transplant from one sibling brother to another. **—Wm. L. Laurence in New York Times.**

Electronic Reader

SYDENHAM, England — Electronics are enabling the blind to read by ear.

With the use of optophone which converts the printed word into musical sounds, sightless Mary Jameson of this Kent town is able to read books.

The optophone, still in an experimental stage, contains photo-electric cells and has a holder for a book. As a point of light traverses each line of a page at a controlled speed, printed letters are converted into sounds.

The pitch varies with the shape of the letters.

MANY PERMUTATIONS

The 'alphabet' has only six sounds but by learning its many chords and permutations, Miss Jameson can read up to 46 words a minute.

The optophone was developed from an invention during the First World War by the late Dr. Fourier d'Albe, a London research scientist. It has not yet been placed on the market.

Some say the device is the nearest thing yet to a machine that will read aloud whatever is put in front of it.

CAN READ LETTERS

Miss Jameson says it is not a prodigious feat to memorize the complicated musical code.

'I think of the scores of squiggles and whirls that sighted people take in their stride when they read their newspapers.'

She can read a newspaper with optophone but, she says, 'It is not easy to find what one wants, and it is hardly practical for that at the moment.'

She can read the typed letters that come to her and can also check her own typing.

'And I am the first blind person to have read an ordinary book.'

—Canadian Press.

New Metric Standard

A NEW international standard of length, replacing the platinum-iridium meter bar which has been kept near Paris as the international standard since 1889, has been adopted by the General Conference on Weights and Measures in Paris. The new standard is the wave-length of the orange-red light of krypton 86, the new definition of the meter (about 3.28 feet) being 1,650,763.73 wave-lengths of the krypton 86 light. The new standard was said to be of great importance to meet the requirements of the present. The smallest measurement that could be made with accuracy with the old standard was said to be one-millionth of an inch, whereas with the new standard it is possible to attain an accuracy of about one part in one hundred million. An error of one-millionth of an inch in the borehole of a guidance gyroscope, it was pointed out, could cause a space shot aimed at the moon to miss by a thousand miles. **—New York Times.**

★ PARIS—A French company has just delivered a rotary rock crusher with a 38-inch-diameter mouth to a cement mill in Verona, Italy. This 125-ton machine can grind blocks of limestone measuring more than 35 cubic feet at a rate of 500 tons an hour. **—Vancouver Sun.**

Machines to Teach Medics

HANOVER, N.H.—Two specialists at Dartmouth college hope to apply the technique of teaching-by-machine to medical and other graduate courses.

They will develop teaching machine programs covering the factual matter in such medical school courses as anatomy, biochemistry, physiology, pharmacology, pathology and microbiology.

In a three year project the investigators will try to assess the validity and reliability of teaching machine techniques in graduate education. They hope to shed light on broad educational questions and contribute to refinement of teaching-machine techniques.

Prof. Robert J. Weiss, chairman of the Dartmouth Medical School psychiatry department, and Edward J. Green, associate professor of psychology, have received a $50,000 grant from the Carnegie Foundation for the work, according to an announcement by Dartmouth.

The teaching-machines to be used were developed by Prof. Frederick Skinner of Harvard, the announcement said. The machine is a box with three slots on top. The student cranks a roll of paper inside the box to make the first question appear inside the first slot. The student then writes his answer in the second slot, turns the crank so that his answer is covered and the correct answer to the question is revealed in slot three. The process is repeated with succeeding questions.

In some experiments the method has appeared to reduce by half the amount of time spent in acquiring a given body of factual knowledge. The method has the advantage of allowing the student to proceed at his own pace and reinforces the learning process by showing him the correct answer immediately after the student has decided on an answer, the announcement said.

From the study the research workers hope to find the best rate at which the difficulty of subject material in a teaching program can be increased. They will also study techniques for insuring that knowledge, once acquired with a machine's help, is not forgotten.

—H. M. Schmeck Jr., in New York Times.

Highway Snow Remover

THE BRITISH COLUMBIA Department of Highways has made a major contribution to the solution of highway snow-plowing with the introduction of a completely new and original machine, the '5000' Series Pacific Snow Vehicle.

The Department could not find the ideal machine for the conditions in British Columbia so it designed its own, and this unique piece of equipment has now proved its value and the wisdom of its designers through three successful winters.

One of the basic factors contributing to efficiency is the ability to handle one unit of snow as few times as possible and preferably only once. To do this, ploughs must be able to move at maximum safe speeds under all conditions in order that the snow can be thrown clear of the highway in one pass. In mountainous areas this problem is complicated by maximum snowfalls (total falls in excess of 30 feet and up to 8 inches per hour) and steep grades. Experience has shown that under these extreme conditions a snow-plough should have the following features: (1) Exceptional visibility for the operator; (2) ability to travel up-hill at efficient ploughing speeds (maximum power-weight ratio); (3) ability to adjust transmission ratios to make the most use of engine horse-power while operating under full load on varying grades.

Inquiries were made, but it was found that such a vehicle was not being produced commercially. Adaptations of commercially available vehicles were offered, but none conformed completely to the specifications and all involved considerable expense. It was felt that a suitable unit could be built in British Columbia at less cost, so further details were worked out by the British Columbia Department of Highways engineers and an order for one unit was subsequently placed with a British Columbia firm.

The cost of this unit was approximately $30,000.

The completed unit was first placed in service during the winter of 1957-58 on the Hope-Princeton Highway, and was subsequently

moved to the Revelstoke area, where it has proven very successful.

In operation on secondary roads, it has been found that this unit with its 45 m.p.h. speed can accomplish in six hours what two graders and a tractor-mounted rotary plough previously required two days to accomplish. On main highways in the heaviest snowfalls, one unit will look after 50 to 70 miles with very little assistance from other equipment.

A second unit has recently been placed in service on the John Hart Highway to provide more efficient service on this important route. **—B.C. Government News.**

Microwave Leaps Ahead

PRIVATE microwave communications, which some leaders in the electronics industry estimate will gross $2,000,000,000 a year in five years, will take giant steps in 1961.

Up to now, the growth of the private microwave field has been limited by restrictive licensing by the Federal Communications Commission. In September, the commission threw out all bars to large-scale development in a momentous decision. Licenses now are being issued to virtually any business organization wishing to set up a microwave system.

Radio microwaves (using frequencies of from 1,000 to 20,000 megacycles) take on optical qualities. They may be focused into narrow powerful beams that can be projected over long distances by relay stations.

STATIONS RELAY BEAMS

Beams are sped on their way at each relay station by parabolic reflectors that look like huge dishes. Distance covered by microwave systems, which shine over high mountains with ease and are almost impervious to weather, range from eight to 1,800 miles. No wires or poles are necessary. Relay stations are usually unattended.

Speech is converted into audio frequency waves that are carried by wires or radio to the first microwave sending station. A series

of steps produces the beam. When it reaches the terminal station, it is reconverted into audio frequencies and then speech.

Any function that can be converted into an electrical impulse, such as pressure temperature and engine speed can be sent to a central point and instantly recorded. Microwave beams automatically regulate the flow of oil wells, send television broadcasts into areas inaccessible through lower frequency transmission and control traffic moving on toll turnpikes. Much automatic controls used by railroads employ microwave techniques.

ONCE RESTRICTED

Prior to the commission's September ruling, microwave system licenses were issued almost exclusively to common carriers (telephone and telegraph companies); Federal, state and local Government agencies, including the armed forces, law enforcement organizations and highway departments; the television industry, and utilities, railroads, pipelines and other 'right-of-way' businesses.

Theodore Smith, executive vice president for Radio Corporation's industrial electronic products department, sees heavy increases for private microwave systems. He sums up feeling by makers that costs for companies with heavy volume of communications are negligible. Mr. Smith points out that no wires or poles are needed and that relay stations need not have attendants in most instances.

R.C.A. already has built a wide variety of microwave installations for users in the restricted fields formerly licensed by the F.C.C. Mr. Smith says that the big increase in private systems will come from beaming of data from computers and other business machines from headquarters of a company to branch offices, factories and warehouses.

His company, Mr. Smith declared, plans to step up microwave equipment production fivefold compared with the rate in the last five years.

Motorola has supplied 1,922 microwave systems, making up 268 complete communications systems to petroleum refineries and pipe-

lines, electric and gas utilities, telephone companies, public safety bodies, railroads, aviation facilities and television broadcasters. The company expects a big rise in sales to all kinds of business now permitted to establish private microwave systems.

The General Electric Company says a private microwave system can be built for as little as $10,000. The company adds, however, that elaborate and numerous kinds of message transmission would cost much more.

Other important makers of microwave equipment include the Raytheon Company, the Collins Radio Company and the Philco Corporation. Philco so far has sold most of its production to the armed forces.

Not all makers of microwave equipment are giants. FXR, Inc. of Woodside, Queens, is a relatively small company with a booming microwave business. The company increased its manufacturing space twice in 1959 and early 1960 and is just completing a new plant that will double present facilities.

'No one can do more than fairly guess the tremendous potential future for microwave,' says Tore N. Anderson, president of FXR.

—Alfred R. Zipser.

★ NEW YORK—A new atomic lamp that generates a light brighter than the center of the sun has been developed. Instead of spreading out in all directions like ordinary light, this light sends out parallel beams that drift apart only 200 feet in 1,000 miles, scientists said. The atomic lamp, with a synthetic ruby at its heart, was developed for Hughes Aircraft Co. of Culver City, Calif.

The scientists claimed it could fire an inch-wide beam of light the distance from Los Angeles to San Francisco without spreading more than 100 feet. Or it could send a similar beam of light the 250,000 miles to the moon, and illuminate an area only 10 miles wide on the lunar surface. Scientists have said the light ray could be highly focused, even secret, means of space communication.

—Associated Press.

★ MONTREAL—Everyone knows that automation is displacing, in particular, those kinds of work where simple hand-methods have been largest. But not everyone realizes that among those most affected by automation are the blind Down through the years they have been taught to do such work as the making of brooms and mops.

Automation has made this type of work more and more unprofitable. Automatic washers and cleaning machines have replaced many of the old-style brooms and mops. These plus cheap foreign imports have raised difficulties for the traditional ways in which the blind have sought self-support. **—The Gazette.**

(*Continued from page* 20)

We have described the North American industrial mechanism as the world's most tenuous. In other words it is the most vulnerable to crippling damage because of the long flowlines of energy and supply between points of origin and use. Probably the most familiar are the high-voltage transmission lines carrying the electrical energy that activates most types of industrial technology, performs countless other jobs, and provides virtually the only type of illumination used on this Continent today.

Electricity has become so much a part of our lives that, even though many have lived in unserviced areas, it is difficult to imagine being without it. We flick a light switch, shave, turn on a radio or television set, toast bread, cook meals, refrigerate foods, and use numerous other appliances with full confidence that the necessary electrical power will be forthcoming. But sometimes the service is unexpectedly interrupted. A high wind may uproot a tree and throw it across the transmission lines causing one or more breaks. The interruption is usually brief, but while it lasts our vaunted modern conveniences are just so much junk causing varying degrees of human frustration. Because the source of power is far removed from our homes, we have no personal control over it. This all-important energy supply is temporarily cancelled out by the chance falling of a tree, thus exemplifying the essentially tenuous character of our entire industrial mechanism.

Past experience indicates that where prior training is given on how to meet specific emergencies, panic can be prevented. Fire drill in schools, for instance, has often proved its merit. This is strikingly shown in the contrasting behaviour of pupils caught in a December, 1958, blaze in a Chicago parochial school. Of the ninety children who perished, most were found jammed near windows or doors in the familiar escape-attempt pattern of the panic-stricken. Those who remembered their fire drill survived. First of all, thanks to the cool-headed direction of a 12-year-old boy who remembered and applied his training, they lay on the floor to avoid the en-

veloping smoke. When help arrived, they were led to safety while forming a line by holding onto each other's belts.

Were there ever an occasion when wide-spread panic might have been expected, it was in 1940 when London and other British cities were bombed interminably by the German Luftwaffe. There was, however, no such general wave of fear. On the contrary, the air raids almost reached the point of being considered routine by the civilian populations who proceeded to shelters as soon as the warning sirens were sounded. Despite the heavy loss of life, panic never became a major problem during the Battle of Britain because the people became conditioned to the raids and knew how to meet them.

This is largely explained by psychiatrist Joost A. M. Merloo in his book 'Patterns of Panic.' In part he observes: 'The tension of a mysterious danger is even more unbearable than danger itself. People hate the vacuum of an unknown situation. They want security. They even prefer war to the insecure expectation of a war with its threat of enemy surprise. This vague fearful expectation acts on their fantasies. They anticipate all kinds of mysterious dangers; they begin to provoke them. It is the evocation of fear and danger in order to escape the tension of insecurity.'

Here is contained the essence of the causes and expressions of panic. Fear of the unknown prompts irrational behavior. Thus defined, panic becomes a predictable trait subject to preventive therapy involving the reduction or removal of the causal fears. The most satisfactory means of achieving this end is through education which explains the reasons of such fears.

It has been learned further that frightened people respond to the direction of 'emergent leaders.' The boy who saved many of his classmates in the Chicago school fire was such a person. Psychiatrist James Tyhurst describes the emergent leader as a person who is not ordinarily interested in community affairs, but during disaster is moved to action by the unusual events and takes over direction of rescue or relief work coolly and sensibly. It is during a disaster's initial impact,

says Dr. Tyhurst, that people are most influenced by others. In this comparatively brief interval, if anyone exhibits fear, those around him are instantly infected. Conversely, it is equally true that a strong leader can exert a steadying influence on persons bewildered by events.

While the emergent leader undoubtedly has an important role in any crisis, and while it has been observed that one usually comes forward, no prior dependence should be placed upon such occurrence. Personnel should be trained ahead of time to handle emergencies. For this reason we have police forces, fire departments, inhalator squads, ambulance operators, communications and transportation trouble shooters, and other groups of specially-trained emergency personnel. They, however, are specialists in handling a situation **after** it occurs. Their training does not for the most part equip them to anticipate and prevent a danger. Training of this type requires a somewhat different approach.

The threat of panic resulting from growing deterioration of the Price System is the most serious ever to confront North Americans. Stemming from the uncompromising conflict between an economy of scarcity and an environment of technology-produced abundance, panic threatens to disrupt completely that installed equipment which must operate constantly to sustain the citizens of this land area. Were the equipment to grind to a halt it could not be restarted because of the utter dependence of all parts upon the continued operation of all others. This would automatically ring down the curtain on the lives of most North Americans.

Should it be doubted that any such large-scale disruption might occur one need only observe a few things which have happened in the absence of panic that support the threat warning.

In the fall of 1960, Canada's two major railroads were almost stopped by an impending strike of certain personnel groups who demanded pay increases which the railroad companies were not prepared to meet. This typical Price System dispute failed at that time to halt a major utility only because of last-minute political legislation enacted to defer the stoppage to a later date.

While such a stoppage would have seriously impeded the flow of food and other materials, this consideration alone would not have stopped the strike which legal action stopped for the time being. Action of this type can be effective only as long as existing or emergently-passed laws continue to be recognized and obeyed—a factor that is strongly modified by the degree of existing economic stability.

Vancouver had an example in November, 1960, of mass behaviour which clearly illustrated how people under emotional stress can exceed the possibility of being controlled. Each year some Canadian city plays host to the Grey Cup football classic which brings together the eastern and western pennant holders in the game that decides the national winner. An unruly incident toward the end of the 1960 game reflected one facet of crowd behaviour, but more socially dangerous were the demonstrations staged on the preceding and following nights. Windows were smashed, furniture was broken, people were assaulted and traffic was immobilized as the main event was celebrated. In a few square blocks of downtown Vancouver occurred far too many illegal incidents for the police to handle. Fortunately, most participants were in a good mood, and, however inane and stupid their actions, were not maliciously inclined. But given the appropriate stimuli, their exuberance could have turned toward any of several directions, including panic.

The potentially disastrous impact of wide-spread panic upon North America's social mechanism has already been stressed. Instances such as those cited above which posed a threat even **without** panic serve as indicators of the considerable peril attending the intrusion of panic. Should an advanced deterioration of the Price System precipitate this peril, there would be no possibility of restraining the wave of violence and destruction which would likely ensue. It must therefore be stopped before it starts.

Knowledge is the best antidote to panic in any form. When people know what to expect and what action to take when the expected happens — as during the Battle of Britain—the inclination

to panic is reduced to a minimum. North Americans must accordingly learn what is happening to their Price System society and why its inability to distribute abundance makes it the greatest menace ever to confront the citizens of this land area.

The study of this problem has been the specific self-assumed task of Technocracy Inc. Immediately after World War I the originators of this organization realized that the Price System had entered its final phase of operation on this Continent, its postdated death warrant having been written by the unprecedented injection of labor-saving technology into industrial processes. The Technical Alliance research group saw that whether or not an adequate social program was designed to meet North American's production and distribution needs, the Price System would eventually buckle under the load it was never equipped to carry. The first step, then, was to design a mechanism which **would** meet those needs. This was accomplished in Technocracy's social blueprint* which culminated years of intensive research.

Having the program and implementing it are two different things. Yet it must be done if North Americans are to survive the end of the Price System. Bridging the gap from the old to the new could be the most hazardous and decisive period in our history. Most of Technocracy's organizational effort is now directed toward achieving a successful transition.

This requires the development of a corps of informed, self-disciplined citizens to give direction to their fellow North Americans confused by the developing economic crisis. The corps personnel must understand how a Price System operates before they can further realize why it is incapable of distributing abundance; they must realize the need of effecting a smooth transition void of interruption of the physical operations which sustain the citizenry of North America; and they must have some knowledge of human behavioural patterns under varying circumstances. Since most people lack the social awareness to inform themselves along the foregoing lines prior

***See 'Technocracy's Blueprint' — November, 1960, issue.**

to a crisis, it falls directly on the shoulders of those citizens with the necessary initiative to prepare themselves for leadership roles. While emergent leaders may come forward to help prevent panic, the most functional persons will be **prepared** leaders who know what to do under panic - conducive circumstances to prevent it. The more informed personnel there is at such time, the less likely are the chances of havoc-wreaking panic.

There are familiar echoes of the past in the pronouncements daily being voiced to socially-unconscious North Americans. Business leaders, while feeling less confident of the future than at any time since World War II, are trying to convince their prospective customers or themselves (or both) that the present difficulty is merely a 'period of readjustment' that will right itself in the near future. Meanwhile, they are concentrating on the 'gimmick market'—a grand selling binge of anything that will help prevent the buying public from thinking seriously about what is happening. As a result, North Americans are probably the least prepared for the major change coming inexorably their way of any populace in history. The potential for consuming panic is accordingly the greatest to occur.

Where the issue of survival is paramount it is irrelevant to ask whether panic can be avoided in the forthcoming Price System crisis. It **must** be avoided if human life and civilization are to continue on this Continent.

—Rupert N. Urquhart.

★ TORONTO—T. R. McLagan, president of the Canadian Manufacturers' Association, states that manufacturing in Canada is no longer keeping pace with the growth of the national labor force.

'This, without question, is a major factor in the present uncomfortably high total of those apparently seeking work and unable to find it,' he told a Canadian National Exhibition directors' luncheon.

Noting that in the past 10 years the percentage of the national labor force employed in manufacturing has declined from 26.6 to 24.8 per cent, McLagan said this was due to intensified import competition. Imports from the United States and low-wage countries like Britain, West Germany and Japan has led to many important manufacturing industries in Canada losing their share of the Canadian market, he said. **—United Press International.**

★ IN THE PAST AGES it was assumed that the gods would destroy the world. Now it is a do-it-yourself project. **—Calgary Herald.**

Let's Measure Up!

Most of the world has switched to the simple metric measuring system. Dr. Howlett, director of the Applied Physics Division of Canada's National Research Council, points out how we have lost out by stubbornly retaining the confusing English system.

EDITOR'S NOTE—We reprint the following article from WEEKEND Magazine in full to bring out the need for standardization and simplification of measurements in the world. The universal adoption of the metric system of weights and measures would be a big step in this direction. Although the following article places the emphasis of argument on Price System considerations, it does explain the advantages of the metric system over the English system.

While the metric system is inferior in some respects to a duodecimal system, it has the initial advantage of already being in general use in most parts of the world, hence its worldwide adoption would be relatively easy. The duodecimal system, which uses 12 digits instead of 10, is now limited in its use mainly to certain merchandising and packaging details. Dozen and gross are number concepts on which the duodecimal system is based. It is the logical system for the future. But as an immediate expedient and as an intermediary step, the metric system is a worldwide imperative. Technocracy strongly advises the immediate adoption of the metric system by the United States and Canada.

WHEN tenders were opened for the supply of machery to a Middle Eastern country, the Canadian bid was found to be the lowest. But the company lost the contract.

'Your product is first-class and it turns out the goods in our country's metric measurements just fine,' the Canadian representative was told. 'The trouble is, the machine parts themselves are designed to your own English foot-pound system. We'll need replacements and that could mean expensive delays. Sorry.'

So that contract went to a German firm which bid higher but which operated on the metric system, its machine components standardized in millimetres, not inches. Such parts are readily available throughout the Midde East.

A leading Argentine industrialist on a buying trip to Canada spent hours poring over a Toronto company's catalogue. The Sales manager naturally took pains to point out the items which his firm could supply more cheaply than competing Euro-

pean firms. The South American, after covering sheets of paper with arithmetic, finally closed the catalogue wearily and picked up his hat.

'Your prices may be better,' he said, 'but I'm so thoroughly confused over your specifications that I'd prefer paying more to European suppliers. They talk my measurement language. What I may save in initial costs in buying Canadian would be more than offset by the time and inevitable mistakes in changing from yards and gallons to metres and litres.'

These incidents emphasize a hard fact: our method of measuring may well decide our survival in international trade. All over the world, Canadian goods compete with those of foreign manufacturers who have a powerful advantage — their weights and measures are easily understood by the customers while ours are beyond comprehension by most potential buyers. People who make the metric system a part of their everyday lives cannot but help favor products made and sold that way.

Since our standard of living is closely related to such trade, the measurement muddle affects every Canadian.

Additionally, our cumbersome way of measuring makes life much more complicated and expensive than it need be for all of us, housewife or student, artist or engineer, scientist or farmer.

It's a hangover from the days when standards of length, volume and weight were haphazard. The yardstick originated in the distance between the nose and fingertip of Henry I. Three barleycorns laid end to end made an inch. The rod was the total length of 16 churchgoers' feet. The fathom, or armstretch, about six feet, varied with the statures of national groups, short for the Greeks, long for the Saxons.

This led to confusion and skulduggery. Traders bought long measure in the country and sold short measure in town. One authority claims the French introduced the metric system in the 1790s because they got tired of being cheated. Even in this century, famed inventor Alexander Graham Bell testified that coal companies paid miners by the long ton (2,240 pounds) and sold to the public by the short ton (2,000) pounds.

We have inherited this mess. Together with the illogically-related inches and miles, ounces and tons, cups and gallons, we must struggle with a weird conglomeration of units including chains, furlongs, bushels, gills, pecks, cords, perches, teaspoons, drams and scruples. Add, too, the complication of different kinds of tons (short and long), pounds (avoirdupois and troy), ounces (fluid and avoirdupois), and miles (nautical and statute).

Against this, the metric system is orderly, clear and extremely simple.

It is based on the metre for length, the litre for volume and the kilogram (kilo) for weight. As a decimal system using the scale of 10 throughout, all calculations are easily made. It requires just the knowledge of a few prefixes such as deci (tenth), centi (hundredth) and milli (thousandths), plus a few basic words. It eliminates the need to refer to the endless tables of the English system.

In linear measurement here's how it works:

10 millimetres — 1 centimetre
10 centimetres — 1 decimetre
10 decimetres — 1 metre
10 metres — 1 dekametre
10 dekametres — 1 hectometre
10 hectometres — 1 kilometre

Solving problems in the metric system is child's play compared to the English system. I remember a Frenchman watching appalled as a Canadian friend figured out the volume of a can that held 9½ pounds of water. To find the answer, the Canadian had to know that a cubic foot of water weight 62½ pounds, that there are 1,728 cubic inches in a cubic foot and 277.42 cubic inches in a gallon (time out to refer to "the tables"). The answer in gallons then became:

$$\frac{9\frac{1}{2}}{62\frac{1}{2}} \times \frac{1728}{277.42}$$

The Frenchman clucked sympathetically when this sweaty ordeal was finished. 'In my country,' he said, 'the weight of water in kilos is the volume in litres. So a can holding 9.5 kilos of water has a volume of 9.5 litres!' This simplicity characterizes the entire metric system.

A measurement curtain now divides the world. The British Commonwealth and the U.S. use the English system, most of the rest of the world the metric, in-

cluding Europe, the Soviet Union, Red China, Japan, Central and South America and the emerging African states. An impressive 90 per cent of the world's population now moves ahead with all the benefits of the metric system.

On our side, fear pervades the air as to our ability to maintain foreign markets. But sentimental attachment to a traditional system can quickly take second place to expediency when the economic pressures mount. Commonwealth solidarity in this respect has begun to crack.

India is changing to metric. Eager to develop her industries, she has been importing almost anything. Can we expect her to continue with imports that can only lead to confusion? Would Canadians buy metric lathes and tools for their own shops?

A New Zealand parliamentary committee has recommended decimal coinage, to be followed by general use of the metric system. South Africa has set next Feb. 14 as Decimalization Day, beginning with its monetary system.

In the U.K. one parliamentary committee has already recommended a change-over, and a switch in the monetary system has just recently been advocated in an unanimous report prepared jointly by committees representing the Association of British Chambers of Commerce and the British Association for the Advancement of Science. More than 2,000 organizations submitted evidence and ideas. The days of the pound, shilling and pence system, which has plagued generations of British school children and countless visitors, seem numbered.

Significantly, the report noted that the metric system of weights and measures is bound to come eventually, although not recommending its compulsory use now.

Interest, too, is churning again in the U.S., which almost went metric nearly 60 years ago. A congressional committee has been making an intensive study, spurred on by business lobbies.

Where does Canada stand in this maelstrom of actual and impending change?

Shockingly enough, we're very much in a backwater area. No preparatory studies have been made, or even contemplated. When the metric system over-

whelms us, as eventually it must, we will be ill prepared. The paradox of this Canadian apathy is that all would benefit by the change.

School children grasp metrics more readily than memorizing complicated tables of English measurement (and soon forgetting them). Length, volume and area are revealed in their basic natural relationships. The teaching of arithmetic would be considerably shortened, the bane of fractions eliminated.

I recall a schoolboy neighbor working out two similar arithmetic problems in the metric and English systems. The first was to reduce 5 kilometers, 7 hectometres, 3 decametres, 3 metres, 2 decimetres, 1 centimetre and 3 millimetres to millimetres. He immediately jotted down the answer, 5,723,213 millimetres.

The second problem required reducing to inches 5 miles, 90 rods, 3 yards, 1 foot, and 9 inches. He had to multiply 5 by 320, add 90, multiply by 5½, add 3, multiply by 3, add 1, multiply by 12 and add 9 to get the answer: 334,749 inches.

Since the metric system is the universal language of science, our children do learn it in school, but too little and too late. I agree with Dr. Edward Teller, the American physicist, when he recently said: 'Before they can catch a glimpse of the order, the scope and beauty of the universe, they are stultified by the man-made confusion of the arithmetic of inches.'

As for the housewife, her tasks would be so much lightened by the metric system I wonder why she hasn't been militantly campaigning for it long before now.

Shopping becomes infinitely easier, the kilo replacing pounds and ounces, the litre eliminating the fluid ounces, pints, quarts, gallons and fractions thereof.

A woman once complained bitterly in my presence of how she'd been deceived over a long period of time in her purchase of the 'king size' in a certain product. It turned out to be just as expensive as the smaller size. 'I thought I was economizing,' she said, quite disillusioned. I asked her why she hadn't figured it out in the first place and she gave me this answer: 'One brand weighs three pounds, 2½ ounces, another two pounds, 15 ounces,

and still another three pounds, one ounce. I detest fractions!'

Prof. Colston E. Warne, Amherst College economist and president of the Consumers Union (U.S.) offers the metric system as a solution to the present chaos that faces shoppers. 'It's the simplest way of comparing prices, he says.

The metric system also becomes a magic wand in the kitchen, eliminating the headache and inaccuracy of recipes that call for fractions of teaspoons tablespoons and cups.

Engineers clamor for the metric system as a relief from the countless hours wasted in conversion tables. They find it a superior mental tool and an aid to visualizing engineering problems. I sympathize with the European-born engineer now working with a Canadian-U.S. firm.

'When I was nine,' he said, 'I could quickly convert any common unit of weights and measures into any other common unit with the metric system. Now, even after 10 years in Canada, I still have to consult the tables to find out that one liquid gallon equals 231 cubic inches in the U.S. and 277½ in Canada; one gallon of water weighs 8.34 pounds in the U.S. and 10.015 in Canada. I have yet to meet a single engineer who knows all the conversion tables. What a tragic waste of valuable time!'

In national defence the metric system finds favor, particularly in NATO commitments with European allies. In World War II differing measuring standards, for instance, for threads on nuts and bolts, had many unfortunate results.

Why, then, with all the admitted advantages, don't the English-speaking countries go metric? At one time, tradition and national pride prevented it. Today, industry thinks of immediate profits and shrinks from the costs involved in the change-over. Those profits may well be seriously jeopardized within the next decade by failing to take the long-range view.

While change-over costs will be heavy, there are some misunderstandings. One opponent of the metric system has claimed that every scale in the country would have to be junked. This, of course, is not true.

Only the weights and the graduate scale would need changing.

One student of the subject maintains that this particular cost would be met in a five-year period by savings in the lead pencils used in 'the unnecessary arithmetic of the English system.'

A few Canadian businessmen see the handwriting on the wall but they are in a minority. The Canadian Pharmaceutical Association made the change a few years ago and is reaping the benefits. The electronics and film industries use metric units. The drug companies, incidentally, found the change-over not nearly as expensive as they feared.

While a national change-over would probably depend on a similar move by the U.K. or the U.S., we need not be caught in an all-or-nothing dilemma. If a Canadian exporter finds he can profit by switching to the metric system he should do it now. I know of at least one enterprising Toronto firm making nuts and bolts which is competing successfully with European companies on their own home grounds. An official of a Canadian equipment supply house in Beirut recently pleaded for more 'far-sighted businessmen who will gear their trade for export, adopting the metric system to boost sales in machinery, tools and the like.'

Before we could switch nationally to metrics we'd have to know the answers to many questions. Should we act in unison with the U.K. or U.S.? Try a 'crash' program or a long stretch-out? Some advocates in the U.S. think in terms of 30 years to complete the change because of their high degree of industrialization. Indian plans call for 10 to 15 years; Japan in a much shorter time. South Africa figures on 18 months just to change its monetary system (the adding machines and cash registers).

As a start, I'd emphasize early study of the metric system in our schools. Initial changes might be made in marking consumer products such as groceries in grams and litres, maps and road markers from miles to kilometres.

Machine tools, dies and gauges are the major problem and would take the longest time to convert. Target dates might be set for certain important moves, such as government contract specifications. Both systems will exist to some extent side by side for some years while machinery

and parts wear out and are gradually replaced.

I think we could complete the change in from 10 to 15 years. The important thing is that studies should be started immediately by such interested groups as the Canadian Chamber of Commerce and the Engineering Institute of Canada.

We are concerned about the Soviet threat to our export trade. Russia has an enormous advantage, being in step with the metric world. The customer prefers taking his business where he doesn't have to worry about a strange system of measurements he can't grasp.

Our scientists use metrics, our engineers, inches, pounds and gallons. They lose valuable time translating back and forth in order to work together. To what extent may Russia's lead in space accomplishments be attributed to the closer co-operation of their engineers and scientists, who both use the metric system?

By our failure to change over to metrics we run the real risk of incurring enormous economic losses.

I recall the flickering lights of Toronto when I arrived there in 1927 as a graduate student. 'Of course our lighting system is out of date,' people told me. 'But to change from 25- to 60-cycle is out of the question—it would be much too expensive!'

Toronto did make the change some 30 years later and by then the costs had increased tenfold. Canada will surely adopt the metric system one day. Let's get ready for it now!

—Dr. Leslie E. Howlett.

★ KANSAS CITY, Mo.—An air traffic control expert has warned that the U.S. faces a 'hopeless' traffic jam in the sky within 40 years as bad as current automobile congestion. Francis M. McDermott, executive director of the Air Traffic Control Association, said that after three years of effort and huge outlays of money, 'we are still as far removed from an effective plan as we were in 1957.'

Mr. McDermott said too many air traffic control facilities are using obsolete radar. He also charged that failure to develop a modern, well-coordinated control system already has resulted in near-tragedies. He observed 'There has been a breakdown in co-ordination, not because of negligence but because the demands of manually co-ordinating hundreds of changes in route, time and altitude every hour had taken its toll.'

He said that if more and more electronic traffic control devices are added to airplanes 'with little regard for operational requirements and without the slightest vestige of an overall plan, we will never have an effective air traffic control system.'

—United Press International.

Age of Adjustment

James Hillier, author of this article from the Brantford 'Expositor' is vice-president of RCA's laboratories at Princeton, N.J. He explains why it is so necessary that non-scientists understand how science and technology affect all aspects of life.

WITHIN the lifetime of every adult now alive, the world in which we live and work has been altered almost beyond recognition by science and the application of its results through technology.

In both its nature and its speed, this material change has no precedent in human history. The technical progress which has occurred in the brief period from 1940 to 1960 equals, and may even exceed the sum of man's technical progress through all the years before.

During these few years, our lives have been revolutionized by the widespread introduction of antibiotics, frozen foods, jet aircraft, television and microwave communications, plastics and synthetic fibres, industrial automation, atomic energy, and a vast array of powerful scientific tools ranging from the electron microscope for probing the infinitely small to the radio telescope for exploring the infinite reaches of the universe.

During the same 20 years, the same science and technology also have carried humanity to the threshold of deep peril and high adventure. They have created new weapons of hideous power and fashioned missiles which can travel within minutes to any target on the globe. They have launched artificial satellites and vehicles for space exploration, opening a path for man's first voyage beyond the limits of the earth.

Science and technology dominate our new environment. Old concepts of time and distance have been demolished, and we have been endowed with vast physical powers which we may use with equal facility to improve man's lot or to destroy human civilization.

As a result, our present-day society faces the most critical question ever to confront any

generation in history: Will we be able to adapt ourselves to the new environment swiftly enough to grasp its opportunities and avoid the disasters which can result from ignorance or misjudgment?

The answer is yes — if we can acquire sufficient knowledge and appreciation of the swift change that has occurred, and of the scientific and technological roots from which it has sprung. It is questionable today whether most of us are fully aware of just what has happened to bring about the astonishing transformation of the past two decades.

It is questionable, too, whether most of us realize that science and technology are now intimately related to virtually all matters of public policy, including both domestic and international affairs, and embracing social and economic as well as military matters.

It would be surprising if there were a widespread public appreciation of these new conditions. The recent technological advances have burst upon the world after centuries in which the affairs of science and technology were virtually isolated from the everyday activities of the average citizen. It is unnecessary to travel far back in time to find the evidence.

The turn of the present century was an era of scientific discovery perhaps unmatched before or since in its impact upon human civilization. Between 1890 and 1910, Becquerel discovered radioactivity, J. J. Thomson identified the electron, Roentgen discovered x-rays, and Albert Einstein formulated the theory of relativity. These are the foundation stones of modern physics. Moreover, during the same two decades technology produced the automobile, man made his first powered flight, and radio signals were transmitted for the first time.

It is clear now that these were momentous achievements— yet they had little visible effect upon the life of the era in which they occurred. The scientific discoveries were of interest only to other scientists. The technological advances followed a leisurely course through another two decades before exerting an appreciable influence upon society. Under the circumstances, there was

little compulsion for the average person to concern himself with science and technology unless, perhaps, he intended to make his career in research or engineering.

The cleavage which then existed between the affairs of science and the affairs of individual and community life prevailed with little change until World War II. Then there came an abrupt change. Under wartime pressure, there was an unprecedented rush upon the resources of science and technology. Vast amounts of money were poured into research and development for military ends, with two highly significant results.

The first was an outpouring of new techniques, devices and systems, including such revolutionary developments as the control of nuclear fission, perfection of jet aircraft, and the creation of electronic computing and data processing systems.

The second was a tremendous expansion of research and engineering organizations, which were capable of meeting wartime needs and were available to satisfy a vast pent-up demand for peacetime goods and services with the termination of the war. In the post-war years, these organizations have continued to expand under the dual pressures of economic competition and the persistent military demand generated by heightened tensions between Communism and the Free World.

Today, scientific discoveries and technological developments follow one another in rapid succession. Where decades formerly were required for the progression from initial scientific theory to final application in useful form, teams of scientists and engineers now work together to accomplish a similar result within a small fraction of the time. Thus we are not only flooded with an unprecedented number of major technological advances, but the process is constantly accelerating. The revolutionary material progress of the post-war period therefore represents a permanent and fundamental change in our environment and in our capability.

The essence of this change is that science and technology, isolated until recently from our daily affairs and our national

policies, have suddenly become dominant influences in shaping these affairs and determining these policies.

In disconcerting contrast to this fact is the absence of any strong evidence that the majority of people have fully grasped the nature and extent of this profound transformation.

There are entirely too many signs today throughout the civilized world that there is just as wide a philosophical gap between our day-to-day lives and the affairs of science and technology as there was during the earlier years of this century. It did not especially matter 30 or 40 years ago. Today, however, it places our civilization in serious danger.

There is, to be sure, far more public discussion today than ever before about matters of science and technology. For the most part, however, this represents a preoccupation with the more sensational occurrences rather than a true appreciation of the scientific and technological background from which they spring.

It is still too easy for a questionable 'expert' to win wide public attention — and even official attention — with opinions of dubious validity concerning significant scientific developments, such as a new medical advance or a proposed space project.

There is still too much evience in surveys and interviews of a tendency among both young and older people to regard science and scientists with incomprehension or outright suspicion.

There is still too great an inclination among our news media to over-emphasize the vastly destructive capacity of modern technology, and to dramatize the achievements of science with a liberal sprinkling of references to 'magic' or 'wizardry.'

When we consider that science and technology are now dominant forces which must affect public policies calling for the support of responsible citizens in a free society, the danger of these attitudes and tendencies is readily apparent.

It is impossible for any democratic government to follow a course best calculated to assure prosperity and peace in the modern world without the backing of a public cognizant of the

major influences at work today —meaning science and technology. If this recognition is lacking today, how is it to be developed?

There is no quick and simple answer, although the need becomes more urgent with each passing year. An approach to the solution must be made from several directions, involving both our technical specialists and the lay public.

Science itself must increase its ability to communicate with the majority of our citizens, describing the progress and significance of its accomplishments in terms that can be comprehended by the non-scientists.

In our public education, greater emphasis must be given to science — not simply for the purpose of training future scientists, but for developing among all young people an appreciation for the way in which science works, and a feel for the intimate relationship that now exists between science and all human affairs.

Finally, our news media — press, radio, and television — must continue to develop their great potential ability to present the achievements of science and technology in a comprehensive and balanced fashion, placing a premium upon information and knowledge rather than drama and sensation.

The objective in all cases must be to provide a sound basis for public evaluation of research and engineering advances and capabilities.

In education, for example, it would seem logical and desirable to insist upon at least one full year of training for all public school students in one of the physical sciences. Such a course should be designed for non-professionals and should emphasize the nature and use of the scientific method in order to instill an understanding and appreciation of how science proceeds.

Furthermore, it is just as logical and desirable to broaden the school curricula in history, philosophy, and literature to give due emphasis to the role of science and technology in the long story of human development.

Against the astonishing background of the past two decades, it is evident that mankind must move rapidly to adjust in thought and spirit to a new age, and that

the penalties of failure to adjust can amount to universal defeat and disaster.

This era in which we now live has been given many popular names — the Atomic Age, the Jet Age, the Space Age, the Electronic Age, and so on. No one has yet called it what it must become if we are to master the immense powers which are now at our disposal. For all of us, this era in human history must become the Age of Adjustment.

★ WINNIPEG—'Unless the position of manufacturing improves, it will be difficult to justify continuance of educational expenditures upon the scale of the past five years, if only for the reason that there will be an insufficiency of jobs in relation to the number of those graduating from institutes of higher learning,' Stuart Armour, economic adviser, Steel Company of Canada, Limited, said here Thursday, October 6th.

Speaking before Winnipeg Canadian Club, Mr. Armour warned: 'Neither agriculture, nor forestry nor mining can provide jobs for more than a fraction of those who quite properly seek to achieve a university education. So if manufacturing is not permitted to flourish, then we must either curtail our educational programmes, or accept the fact that we are educating Canadians who must seek jobs elsewhere.'

—Vancouver Province.

★ LAKE WALES, Fla.—A Methodist minister here is offering five trading stamps to each person attending Sunday night services.

Rev. Robert Boggs of the First Methodist Church said he is doing it because 'It's my impression that some feel more at home where trading stamps are offered than they do in the normal church service.' **—Associated Press.**

★ ANN ARBOR, Mich.—A University of Michigan sociologist predicts that 90 years from now the population of the United States will reach 600 million, almost triple its present total. The increase is predicted on a continuing decline of mortality as scientific progress grows. **—United Press International.**

★ CHAPEL HILL, N.C.—A mechanical man with a computor brain will be in use within 100 years to explore other planets and mine their minerals, it was predicted here by Dr. Masanao Toda of Japan's Hokkaido University.

—United Press International.

★ NEW YORK—The world's population is increasing by 48 mililon a year and now stands at 2.9 billion says the United Nations Demographic Year Book. Communist China, with 669 million has the largest population. **—Associated Press.**

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer mechanic, teacher, preacher or house wife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

'. . . A NON-POLITICAL FACT-FINDING BODY OF EXPERTS IN THE VARIOUS DEPARTMENTS OF APPLIED AND THEORETICAL SCIENCES, WHOSE AIM IS TO REVALUATE INDUSTRIAL OUTPUT IN TERMS OF ENERGY FACTORS.'

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What Price Peace?

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Quarterly Survey

Scientific Symposia

It is no longer possible for one man or group of men trained in any branch of science to be sufficiently familiar with the whole vast body of available scientific knowledge to achieve an unassisted correlation of all data pertaining to the physical and social environment. Accordingly, a c l o s e r liaison amongst scientific personnel in all fields must be the goal of all future endeavor.

This, in essence, was the understanding which brought 7100 scientists to New York during the final week of 1960 for the annual meeting of the American Association for the Advancement of Science. Whether or not their chief motivation was — as reported in numerous Price System publications — a realization that scientists of the Communist world have been making uncomfortable gains over those of the 'free' world, the importance of the session was the bringing together of scientists of highly specialized training to present research reports on past findings and to get leads, from the reports of others, to assist in planning subsequent research programs.

Contrasting sharply with the highly emotionalized political conventions preceding the U.S. presidential election, the AAAS annual meeting proceeded soberly to an objective consideration of the numerous items on the immense agenda. Each item was dealt with in a symposium of those scientists most directly associated therewith. It was the final correlation of all disclosed findings that emphasized the need for scientists to extend their fields of operation somewhat beyond their previous fields of specialization in order to get a better perspective (within Price System limitations, of course) of the total picture of scientific requirements.

Included on the agenda were symposia on criminology, education (with papers on advanced and retarded children), the scientist's role in the commu-

nity, the metric system, scientific manpower (with papers on science aptitudes of high school students), genetics, population trends, and the increasing significance of energy in an expanding world, to mention only a few. These indicate the broad scope of material considered, including the loosely-defined 'humanities' which are not generally thought to be matters of scientific concern, but are nevertheless studied in criminology and other categories.

Triple Trouble

Foreign imports, increasing bankruptcies, and unemployment are three problems causing serious trouble to the Canadian economy according to recent news releases bearing Ottawa datelines. That this is so is no surprise to Technocrats, but the frequent appearance now of such items in the Price System press serves to substantiate the observations made public by Technocracy Inc. over the years.

Concerning textiles, the Senate committee on manpower was recently told that imported textiles have cost the Canadian industry 35,000 jobs in the last year, and that the situation threatens to become worse. Foreign-made fabrics are already outselling Canadian products in the domestic market, according to a Primary Textiles Institute brief, and are likely to cost the jobs of an additional 14,000 textile workers by 1970. Textiles from Japan and Hong Kong are ruining the Canadian industry, says the Institute's president M. W. Berry of Montreal.

Twenty-one per cent more Canadian businesses went bankrupt last year than in 1959, and the defaulted liabilities that resulted increased more than half. The Dominion Bureau of Statistics reports 2,699 business failures in 1960 as against 2,229 a year earlier. Failures during this period jumped from 672 up to 919 in the trade sector — automotive products, clothing, hardware, furniture, building materials and general merchandise. Manufacturing failures increased from 374 to 546, and construction failures from 449 to 604.

The third major need for a good moisture-absorbent crying towel was the mid-February

unemployment figure reported by the Dominion Bureau of Statistics. This stood at 719,-000 persons, or 11.3 per cent of the labor force, and was 26,000 higher than the previous record set a month earlier. In February, 1960, the number of unemployed comprised 9.6 per cent of the labor force, or about 600,000.

Vehicular Villain

The breakdown of commuter rail and urban bus services is strangling cities from coast to coast. The motorist who insists on using the family car for door-to-door travel between home and job or downtown stores has been described to a U.S. Senate subcommittee as the villain of an American crisis.

Richardson Dilworth, head of the Conference of Mayors, told the subcommittee that over 300 cities, towns and villages had lost all mass transportation since World War II because rail and bus lines were losing money. Now they are facing the problem of having to restore those services, by federal subsidy if necessary, to relieve the increasing traffice pressures. To the question of how motorists could be persuaded from using their cars for every city errand, several answers were offered in a characteristically Price System fashion. It was reasoned that:

Motorists will use their private cars less within the city when increasing costs — gasoline, taxes, tolls, parking fees and fines, scraped fenders or more serious collisions — make this too expensive. Another deterrent will be the stricter enforcement by police of no-parking regulations. They will ride the trains and buses more regularly when service is better and fares are reduced and when equipment is more comfortable and kept clean.

Undoubtedly these factors will have some restraining influence on private motorists as the congestion and expense factors become more severe; but only an engineering approach concerned solely with moving people and materials in the most efficient, least costly (energy-wise) manner can provide a solution. Such a solution is an integral part of the Technocracy blueprint.

Making With Words

Language as a means of communication is highly important and useful, but is too often used instead as a means of subjective expression. The story teller thus 'makes with words' in order to be an artist rather than an objective chronicler.

WORDS, written and spoken, are a means of communication; beyond that, they are a means of persuasion. However, the effectiveness of words, both as a means of communication and as a means of persuasion, is highly over-rated.

A rather large number of people feel that they have a vital message for all mankind. They feel that, if only they could put that message into words and then get those words widely distributed, the history of the human race will be altered from that time on. Such are the capabilities of self-delusion; for, when some of these 'world-shaking messages' are put into words, they turn out to be pitifully unimpressive to others. The subjective aspect of the message fails to be communicated. The 'messiah' feels frustrated and lonely when he does not get the response he expected; when his persistent reiteration of the words 'of great wisdom,' instead of gaining converts, tend to alienate his friends and associates. Actually, great messages turn out to be very few and far between, and seldom are they duly appreciated by the contemporaries of the authors; for, often as not, they do not penetrate the subjective 'shell' that shields the concepts of man from innovation.

Words are abstract symbols which we learn to associate with certain perception patterns in the brain; but, since most perception patterns are at least fifty per cent subjective, the same words may mean widely different things to different people although they 'speak the same language.'

Language, nevertheless, is highly important and useful to human beings. Among other things, it conveys impressions, if not always ideas, which help

guide us in our daily activities and in our dealings with other individuals and groups. Most of us have made workable associations between the few hundred word-symbols in common usage and the things, people and movements around us. Words, when spoken, may be supplemented with gestures and differentials of tone and volume of voice, which often convey even more meaning than the words themselves. There are certain guidance words which we learn to associate with certain daily activities — words of greeting, simple directives, expression of wants. As often as not, however, guidance is accomplished without words — by such things as color and position of traffic lights, the position of the hands on the face of a clock, the ringing of bells or buzzers, a motion of the hands, or sign symbols such as an 'arrow' pointing in a certain direction. Thus we learn to get about in our environment, and words play a certain part in this activity.

A more advanced use of words comes into play when giving and receiving more complex or unique directives. Here, words are more necessary in effecting communication and are moderately effective; often they are most functional as supplements to pictures and diagrams.

The most significant use of words is their capacity to record and store information. They achieve their highest function when they are employed carefully and objectively to describe things and events; even so, 'a picture is worth ten thousand words.' Hence the records of the past are most significant when they are made up of careful descriptions. However, it is in this respect that most such recordings are weak. Authors are not very happy about writing 'mere' descriptions of things and events; it does not leave them enough room for 'self expression.' This 'self expression,' although of utmost interest to the author, usually turns out to be highly subjective and of little moment to others at a later time. Hence, the literature of the past is filled with 'doctored' tales, subjective interpretations, fanciful conjectures and speculations, but very little clear description. Consequently, it is

very difficult to get an accurate picture of past conditions and events from what has been written about them. Often more relevant clues are revealed by archeological exploration.

The writer or story teller wants to be an artist rather than a chronicler; which means that that he 'must include something of himself' in his accounts. That 'something' is often no more than a fanciful 'making with words.' The epical poets, perhaps, are the worst offenders; to them, the artistry of wording means more than the accuracy of the substance. The dramatists are not far behind, if at all; they are intent on making a good story regardless of how well it jibes with actual events. We need merely refer to the script writers for Hollywood movies to indicate what we mean. However, these script writers were not the first to blemish history with rhetoric.

Although description constitutes the highest function in the usage of words, it has been of only limited effectiveness. Before modern methods of quick and easy production and reproduction of pictures were developed, word descriptions were employed more lavishly than now. The literary artist refused to be 'merely' objective in his descriptions and tended to load them with subjective material; hence, the descriptions become confusing and tiresome to later readers. Many of the great classics of the past are seldom read today for that reason. The human mind is limited in its capacity to translate words into pictures that in any way resemble the original scenes that were translated into words — even when the description happens to be clear and objective. The introduction of subjectivity makes fiction out of fact; it turns the world of things and events into a dream world of wish-fulfillment. Hence the *Iliad* and *Odyssey* of Homer are works of art, not a record of history. The same applies to the story of *King Arthur and the Knights of the Round Table.* Even the official national histories of World War II would be more at home in the Fiction Department of our libraries than in the archives of history—Winston Churchill's six volumes, for example.

The people who are most skilled in the use of description are the scientists. They are trained to describe things so that those who follow them will know of what they write. The scientist is less concerned with fanciful language than he is with accurately conveying a specific message. To avoid ambiguity, the scientists in each specialty tend to develop a precise jargon; which, while it is clear enough to others in that special field, is 'Greek' to people outside that field. This is unfortunate; for, it strictly limits the area of communication. Certain workers in science go even further and become pedantic in their writings, and to that extent they are boresome. That one can convey a great message in science without being pedantic is amply illustrated by Charles Darwin's *Origin of Species*. There, the evidence in support of a theory is so clearly portrayed in easily understandable language that the reader is convinced long before he has read the full text; in fact, the book is seldom read in full anymore because the evidence is so overwhelming in volume that it is now regarded as redundant. There is nothing more persuasive than facts; and Charles Darwin's 'Theory of Evolution through Natural Selection' is supported by an abundance of facts which are verifiable and unmistakable.

Factual descriptions form the body of scientific knowledge. The next step is that of correlating facts in an effort to arrive at a more general understanding of nature and history. This is a hazardous step and can readily lead to grave errors. The gamut of ancient cosmologies illustrate where speculation regarding the 'meaning' of facts may lead. The man who lays down a hypothetical principle regarding the relationship of certain facts has put 'something of himself' into it; he has become a creator; he has a subjective 'baby' to nurture. The chances are, he will not be strictly objective from then on; but, rather, that he will tend to rig nature to fit his principle. Among scientists, there is a saying, 'beware of the man with a theory.' An induced principle in science is tentative and without merit in its own right. Even Darwin's theory of 'Natural Selection' does not

explain all evolution. In the light of new evidence, it is not as all-important as Darwin considered it to be.

Unlike in philosophy, an induction or generalization in science must be verified to be respectable. This is done in two steps: First, deductions from the principle are formulated — indications of what must necessarily follow if the principle is correct. Second, the deductions are checked against observations of additional facts. This completes the scientific method. The principle is only as good as the unanimity of the facts which support it. For example: Prior to World War II, a series of observations of various kinds indicated that the higher one ascended into the atmosphere the lower the temperature would be, until far out in space one would encounter a temperature close to absolute zero. But certain other observations of more recent date; among them, observations of the mode of travel of sound waves following tremendous blasts (occasioned by the destruction of war munitions and fortifications after the war) revealed that the sound did not travel as it should within that theory. A new generalization, accordingly, was formulated to explain these new facts —that there is a high temperature zone at a considerable distance up in the atmosphere. Further deductions and observation of additional facts seem to verify this latter theory. It is accounted for in part by the theory that high energy particles from outer space discharge their energy then colliding with the molecules of the upper atmosphere of the earth. Much more investigation will be conducted before any firm theory is accepted, however.

The scientific process of describing the universe, however exciting it may be, is too restrictive and precise for the literary artists. Journalists, for example, get a few 'leads' and cut loose with fantastic speculative projections — World of Tomorrow stuff. The Science Fiction artists create even wilder phantasmagoria. The laws of physics, chemistry, and biology become suspended while ecclesiastic-like miracles are entertained.

The manipulation of words

reaches a high degree of artistry when employed to influence the behavior of people through persuasion. This is generally known as propaganda. In propaganda, words are used to convey falsehoods, partial falsehoods, distortions, glittering promises, and association and misassociation of ideas; they are used to arouse emotional reactions and to stimulate mob action. Propaganda may, on occasion, have considerable intellectual content, although this is usually slanted rather than played straight; more often, it is loaded with emotional content and otherwise contains just so much blather. Consider, for example, political speeches, preaching, and commercial advertising.

Certain words are worked into the consciousness of the unwary as symbols of 'good' or 'evil,' and the unwary people respond to these words accordingly. Among the 'bad' words currently in use are *socialism, communism, paternalism, atheism, materialism, government enterprise,* these are enough to make a confirmed conservative froth at the mouth. Among the 'good' words are *democracy, freedom, spiritual ideals, faith, private enterprise.* International political propaganda is very much in vogue at present; and this is a very poor source of information about the conditions and events in the world. How much reliance can you place in a State Department 'White Paper?'

If a radio commentator or newspaper articles uses the word 'Peiping' when referring to Peking, or uses 'Nationalist China' when referring to Taiwan (Formosa), you know immediately that the propaganda line is being played and that the statements must be discounted by at least fifty per cent. Certain writers and commentators you learn to discount nearly a hundred per cent. When one speaks or writes of the Free World and the Slave World, you know he is off on a propaganda binge; nothing he says is likely to be worth the time spent in listening to, or reading it.

Another use of propaganda, perhaps its major use, is for promoting the sale of merchandise. Salesmen are out to sell merchandise; everything they say is directed toward that

end; hence, their words are not to be trusted. They will distort facts, play tricks on the customers, and lie about competing products. Most of their sales talk is mere patter which they have memorized; it is not based on personal knowledge. We recall the enthusiastic claim of a vacuum cleaner salesman that his 'vacuum' had a suction of 35 pounds per square inch. When we pointed out that the theoretical maximum would be only one atmosphere, about 15 pounds per square inch, he quickly pleaded personal ignorance of such technical matters. We let him off the hook by suggesting that, perhaps, he had overlooked a decimal point in the middle of the 35, and it should be 3.5.

Scientists and technologists must be very careful in their use of words, that they may effect accurate communication to others. They have learned from experience to be cautious and reserved, particularly in their extrapolations. In doing this, they constitute an annoyance to journalistic writers, who tend to throw caution to the winds and become flamboyant in their 'scientific predictions.' This contrast is amply illustrated by the publicity writings on atomic energy immediately following the cautious scientific announcement in 1939 of the successful achievement of atomic energy release from fission of the Uranium-235 atom (before the politicians clamped a silencer on all atomic energy information — and misinformation).

Polemicists and journalists write for the moment; they write for effect, not to record accurate information. It is of little concern to them whether facts are loosely treated, or even ignored; they are out to make a point or tell a 'newsworthy' story. Tomorrow, they may reverse what they said yesterday if it serves their purpose; and they do so without blushing and, seemingly, without loss of reputation. But, if a scientist or technologist makes a serious error, he is suspect for a long time afterward by his fellow scientists.

The social technologist must observe the same caution and devotion to factual accuracy. He does not have the leeway for aberrancy which pertains to the

social planning, thinking, and action of the social philosopher and political Leader. The social philosopher can speak glibly of the *ideal* society, the *good* society, the *evil* society; and it makes no difference, for he is operating in the realm of subjective fantasy, not in a world of physical materials and energy transformations. With an adroit manipulation of words, the philosopher can build up a sound, logical case in support of such social forms as monarchism, feudalism, fascism, communism, socialism, democracy, republicanism, or anarchy. He can build up a case for a classified society or for a classless society. In the realm of fantasy, he can choose whatever pattern suits his fancy and temperament. Not so, the social technologist. He must analyze the basic factors in the society; find out how it operates, and what is needed to make it operate. He can't be bothered by such subjective concepts as good, bad, evil, ideal. He can't let himself be influenced by name-calling from the galleries of social philosophy — by such names as *materialist, atheist, paternalist,* or *technocrat.*

The social technologist thinks in terms of organizing and operating the society as a functional mechanism, which his analysis shows it to be. But this concept throws the philosophers into a dither—sometimes into screaming hysterics. 'Why,' they screech, 'the materialists refuse to take into consideration spiritual values, liberty, or human dignity.' Of course, the social technologist doesn't consider those things; why should he? Those are just words, rhetorical froth. So the witch-doctors (as descriptive a word for them as any) revile science and technology; these are too precise, too accurate, too uncompromising; the things with which they deal are not subject to manipulation by 'making with words.' The philosophers of communism are much closer akin to the philosophers of fascism than either are to social technology.

The application of science to the social order is the utmost in heresy insofar as the social philosophers are concerned. It is a dynamic program of analysis and synthesis; of further

analysis, refinement, and synthesis, continuously. Change is always in the direction of adaptation to physical conditions and toward the improvement of social operations. To the social technologist, the human individual is primarily an energy-consuming device; he does not think of the individual as a 'moral being of infinite worth.' As an energy-consuming device, the human individual needs fuel (food), bodily protection from the hazards and discomforts of the environment (clothing, shelter), personal physical care (health care, sanitation, freedom from toil, optimum exercise), individual conditioning (education, training), and an optimum environment in which to grow up and operate (freedom from corrosive contamination, restrictive movement, and destructive assault). The human being is a complex and delicate machine that requires special care and protection.

The social philosopher and politician refuse to acknowledge any such responsibility toward the human being; their concern, they say, is with his 'soul' not his body. But they never describe what they mean by 'soul.' It is just another word they use to confound the thinking and emotions of man.

Technocracy has long been the name given to a social order based on science. Technocracy is a social technology; hence, it is non-political, non-sectarian, non-commercial. It deals only with the physical matters pertaining to the operation of a social mechanism on an Area of Operations. It speaks the language of science, not the language of philosophy. It is a new order of social operations designed for the conditions of the present time; it pertains particularly to the North American Continent since this Area is the most technologically-developed area on earth at this time.

The analysis of social conditions on the North American Continent revealed to Howard Scott and his associates, following World War I, that the major problem of this society was the destribution of an abundance. In accordance with their findings, they designed the next most probable state of society for this Continent. Physical

factors, not opinions or ideals, governed their conclusions. Out of their work came the 'blueprint' of the Technate of America.

During the past forty years, both the analysis and the design (the synthesis) have been assailed from all sides by many groups, some of them with powerful financial backing. But all such assaults have failed in their purpose; they were based on words, not facts. When words failed, they were followed by a conspiracy of silence, likewise to no avail. The validity of Technocracy's analysis and design is as strong today as it has been over the past forty years; it has not been cracked or dented.

Regardless of how the words of propaganda are manipulated, Technocracy still remains the next most probable social state for the North American Continent. —*Wilton Ivie, CHQ*

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* WASHINGTON—The world is spending $330 million a day — $14 million an hour — on arms and armies. In sum, mankind is spending at least $120 billion annually to preserve its respective hunting grounds inviolate — or for the ultimate purpose of encroaching on those belonging to others.

The United States and the Soviet Union together spend about 73 percent of the total, or $88 billion. The arms race is costing the world $40 a year for every man and woman and child now living. If the world were to collect all this money into a common pool for peaceful purposes, the average annual cash income of every Chinese, Indian and Pakistani — 1.2 billion people who net less than $100 each year — could be more than doubled.

—ASSOCIATED PRESS

* THE CITY of Rome, N.Y., population 51,000, almost went into a panic recently when the federal government announced it might move part of the nearby Griffiss Air Force Base to another state. The move would mean a loss of 6,000 local jobs.

Community reaction was swift. An empty store was opened so that people could send telegrams of protest to President Kennedy: 'for $1.21, charged to your phone bill.' More than 1,000 telegrams were sent the first day. Nearly the entire New York Congressional delegation descended upon high Pentagon officials to deliver a separate protest. A citizens' group flew to Washington to make their personal protest at the Pentagon. Governor Rockefeller issued strong statements decrying the move. —THE NATION

* OTTAWA—A report on the amount of debt carried by Canadian consumers gives strong emphasis to recent warnings of the effects of the growing burden of consumers credit. Debts in three areas of consumer credit totalled $1,738,900,000 at the end of 1960 — 8.4 per cent higher than a year earlier, the Dominion Bureau of Statistics reported.

The three areas: Consumer goods loans by sales finance companies, cash loans by sales finance companies, cash loans and installment credit by small loan companies, and accounts owing to department stores. —THE CANADIAN PRESS

What Price Peace?

The following article is in response to a CBC television broadcast of January 31st, with Dr. Linus Pauling as guest. The author indicates that a prolonged failure to achieve peace could prove fatal to the people of North America.

A PROGRAMME on the CBC television network recently devoted an hour to a discussion of the likely effects of an all-out nuclear attack on North America. Taking part in the debate were some of the top names in nuclear physics, including Dr. Linus Pauling and Dr. Edward Teller. The objective appeared to be an attempt to evaluate the effectiveness of fallout shelters.

It was inevitable, of course, that this line of discussion lead to declarations by many of the speakers that the only defence against nuclear weapons is to prevent their use. Since this corresponds with the editorial viewpoint held by Technocracy since the dawn of the nuclear age, we will forego further discussion of it here and explore what we consider would be a very important corollary to the adoption of this view by the federal governments of the United States and Canada.

One of the first moves would naturally have to be toward a disarmament agreement. One requisite for the accomplishment of such an agreement would be the arrangement of a worldwide moratorium on the production of arms. Assuming that such an accord could be reached, let us try to visualize the economic results. The principals in any agreement of this kind would be the United States and the Soviet Union, so for the sake of simplicity let us analyze the probable effects it would have in each country.

According to reports of western observers, the standard of living in the U.S.S.R. is many times higher than in pre-revolution days. By the Russians' own admission it is still far below that of the United States. While we do not profess to know what percentage of Russian pro-

duction is going into arms, it seems obvious that a Russian conversion from arms to consumer goods would represent an economic advantage to the Russian people, and an even greater political advantage to their leaders. Viewed in this light it makes one wonder if, after all, there may not be a semblance of sincerity in current Russian demands for total disarmament.

A report of the Douglas Committee, released in the United States late in 1960, reveals that the Pentagon, in 1959, pumped in excess of $38 billion into the economic bloodstream in the form of defence spending. In spite of this, unemployment is over five million and inventories of unsold consumer goods are sorely taxing the storage facilities of Uncle Sam.

It would therefore seem that a conversion of $38 billion from arms to consumer goods would not effect an increase in U.S. living standards, since there are already available more consumer goods than the population can purchase. Hence it appears that any reasonable approach to the attainment of world peace must, of physical necessity, be preceded by basic economic reform within the United States. In a word, Uncle Sam must effectively rid his economic tree of vultures if he sincerely wishes the dove of peace to nest therein.

Comparing the two economies in an atmosphere cleared of arms production, it is significant that, for the Russians, there would be necessary no change in basic social concepts. They would merely continue, at a faster pace, to pursue an objective as old as civilization itself — that of striving to reach a state of development which would produce enough to satisfy the needs of the population. United States, having reached that potential many years ago, would be faced with an entirely different set of circumstances. Science and technology have licked the problem of scarcity but society has not yet recognized the need of adopting a complementary method of distribution.

Here, we feel, is the crux of the matter. In order to survive and progress without the economic stimulation of arms pro-

duction, North America must generate an entirely new social attitude to the problem of distribution. If it is to be commensurate with our productive potential, full consumption will be the inevitable result. We see no reason why this should be anything less than a privilege of citizenship.

Achievement of this basic change in social concepts would be of immense economic value to the people of North America. More important still, it would forever relegate communism to its proper social position as a viable modus operandi for those areas which can afford nothing better.

If this makes mandatory the adoption of Technocracy, as proposed many years ago by Howard Scott, we disclaim any responsibility for that necessity. Our views in this direction evolved, as did Technocracy itself, from an analysis of the physical facts of our environment.

North America would do well to fully explore the avowed desire for peace so loudly proclaimed by the U.S.S.R. Prolonged failure to do so might prove, too late, that they want peace badly enough to depopulate North America in order to get it.

Whether or not they could succeed is purely academic. We simply cannot afford to call the play. —*Fred Buckley*

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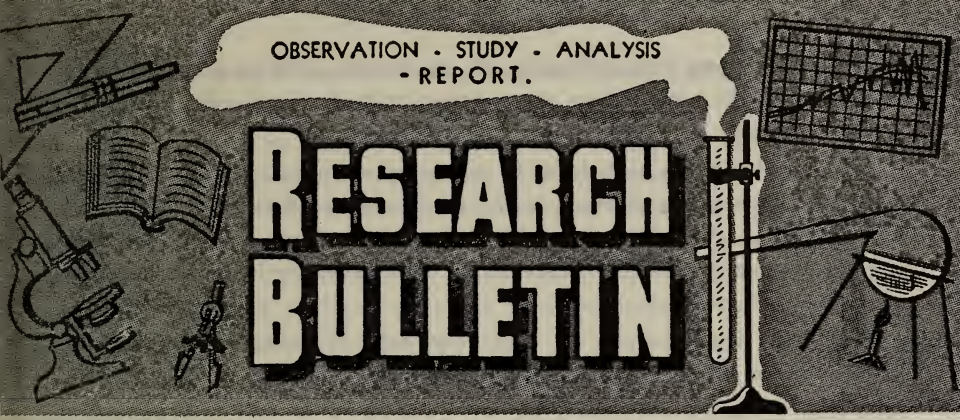
* SAN FRANCISCO—A Swedish medical researcher is experimenting with a drug that conceivably could brainwash a nation's population in hours or days. The initial effect on humans is to increase their acceptance, he said. Its testing has been underway only three months so its powers are far from fully determined.

Added to the water supply, this drug might bring about a profound change in the thinking or behavior of a community before anyone was aware of its workings, said Dr. Holger Hyden, a specialist in cell functioning. He was addressing a symposium on control of the mind, sponsored by the University of Goteborg.

The drug is an inexpensive compound called tricyano-amino-propene. It works by causing changes in the chemical structure of ribonucleic acid — RNA — an important constituent of all living cells. In this case it works on nerve cells, particularly when they have been stirred to activity by stress or some other stimulant. Changes caused in the structure of nerve RNA by administration of the drug were measured by Dr. Hyden and associates.

—ASSOCIATED PRESS



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Heart Research

THE HEART rate of athletes during violent exercise has been monitored through use of small equipment worn by athletes. The next step is to develop equipment that can be worn by heart patients to enable their daily routine to be checked by their doctor.

The projects are under the direction of Dr. J. E. Merriman, assistant professor of medicine and director of the cardio-pulmonary laboratory at the Saskatchewan University Hospital. Co-operating are B. A. Holmlund and R. Cobbold of the College of Engineering and Dr. W. A. R. Orban and Dr. Don Bailey of the School of Physical Education.

In experiments held already, an athlete has carried equipment on a belt, with electrodes fastened on his skin near his heart. The equipment consists of a miniature radio transmitter, electrocardiographic amplifier and batteries. It records some of the electrical impulses of the heart — not as many as the standard electrocardiogram that is taken in a hospital or doctor's office, but sufficient to give a record of the heart rate.

The significant part of the experiments has been that the signals

have been relayed over distances of up to one mile to a conveniently-located receiver where they were tape-recorded. Later, the recordings were analyzed.

Adapting the technique to everyday situations for heart patients will necessitate some changes to the equipment so that more information can be transmitted over longer distances. In other words, so that a complete electrocardiogram can be taken and transmitted for recording at the doctor's office.

With this situation, Dr. Merriman said, it appears possible that a doctor would know exactly the type of activity his heart patient should avoid.

For example, the device might record the fact that the heart was under stress on one occasion one day. Checking, the doctor learns from the patient that he'd climbed a flight of stairs quickly. The doctor then cautions the patient to avoid this type of stress.

Of course, it's common today for a doctor to give a known heart patient such advice. But, explained Dr. Merriman, in many cases, all the presently available tests have yielded normal results and still it's not definite to the doctor that his patient has or has not heart trouble. With the electronic unit monitoring a person's activity constantly, the doctor knows for sure when the heart is acting up, and the cause. He can then make recommendations on the type of life that should be led.

It may be all right for patient A to play golf, but patient B better stick to watching the game, Dr. Merriman said.

In tests with athletes that are continuing on a regular basis, Dr. Merriman and his colleagues are getting a good idea of what the normal heart can do, and they are learning something of the benefits of exercise to the heart.

Among the questions to be answered are:

What is the normal heart rate response during exercise? How does the response of an athletically untrained but healthy person differ from that of a well-trained athlete? Does training improve the efficiency of the heart? How does the heart respond immediately before the starting signal in an important race?

Dr. Merriman made it plain that 'we have obtained preliminary observations only.'

However, he said, 'we believe that there are definite differences between the athlete in condition and "not in condition." In some athletes the heart rate increases to 188 per minute during strenuous exercise. There are definite differences in the heart rate response to exercise between athletes and non-athletes. In addition, we have observed different patterns of heart rate response to exercise which have not been previously reported.

'It is our hope that with an improved system we will be able to answer some of the questions put forward above, in addition to developing similar miniaturized equipment so that patients with heart disease may be continuously monitored during their daily activity,' he said.

—Western Producer

Taconite Ores Tapped

HIBBING, Minn.—Minnesota's billions of tons of a heretofore worthless hard rock that for generations defied and exasperated iron ore miners may yet prove one of the nation's most valuable industrial resources—a gigantic new metallics supply for the steel industry.

These are semitaconite, a relatively softer rock that contains a large percentage of nonmagnetic iron particles, and a nonmagnetic variety of taconite, a flint-hard rock. These underlie much of northern Minnesota's fabulous Mesabi, Cuyuna and Vermilion iron ranges. For years, iron miners, trying to get at richer direct-shippnig ores, had to remove enormous quantities of the troublesome rock.

The solution of the problem was to find a feasible and economical method of separating these nonmagnetic iron particles from both types of rock, then processing them into a valuable and rich blast furnace feed material. The key to the problem seems near at hand.

BOOST TO MINNESOTA

M. A. Hanna Company, one of the nation's largest and most experienced iron ore firms, believes its researchers may have uncovered the solution. That is why it has just built and put into operation a $2,000,000 semi-taconite processing pilot plant at Cooley, Minn., 14 miles west of Hibbing. Recently it showed off the new plant to newsmen and Minnesota state senators and representatives.

If it proves successful, it will be an invaluable aid to various presently depressed Minnesota iron ore communities in making an economic comeback. It should also benefit the harried American-flag Great Lakes fleet which lost much of its business to low-cost foreign competitors in hauling foreign iron ore destined to the United States blast furnaces.

And it will give the American steel industry a new, safe and sure domestice metallics supply.

Hanna expects to make the findings of its pilot plant operations available to the whole iron-producing industry.

RESERVES RAN LOW

For generations, the rich iron ranges of Minnesota, Wisconsin and Michigan furnished 85 per cent of the ores smelted in U.S. blast furnaces, transporting most of the ore by United States-flag Great Lake ships to lower Great Lakes ports. This iron went into the millions of tons of steel used annually for manufacturing new automobiles, bridges, steamships, household appliances, toys, railroads, buildings, tin cans and other containers and innumerable other items.

Then after World War II, some richer deposits began playing out. Steel and ore firms developed big new foreign deposits, such as in Venezuela, Labrador, Liberia and elsewhere; but they also turned to extracting magnetic iron particles from one variety of taconite.

This is done by crushing the rock to face-powder fineness, then magnetically extracting the iron. These then are rolled into marble-sized pellets, testing 64 per cent iron. The richer Lake Superior ores tested about 51 per cent iron.

These rich pellets have proved one of the most exciting and significant developments in steel plant operations in years. Mixed with other ores, the pellets helped boost production of many blast furnaces by 25 to 50 per cent—with attendant big savings in capital, materials, wages and other costs.

EXPLOITATION DEFIED

That is why steel and iron ore firms in the last half dozen years spent nearly $1,000,000,000 in building plants in Minnesota to process magnetic taconite, and in Michigan to process another rock, iron-bearing jasper. Biggest of these developments is Erie Mining Company, a $350,000,000 project owned chiefly by Bethlehem Steel Corporation and Youngstown Sheet & Tube Company, and Reserve Mining Company, a $250,000,000 venture jointly owned by Republic Steel Corporation and Armco Steel Corporation.

But the much-more plentiful nonmagnetic taconites and semitaconites defied exploitation — until now.

Hanna's director of beneficiation, studious S. E. Erickson, who spends his leisure in writing highly technical articles or in prowling iron mines of the Phillipines or other distant places, believes success of Hanna's pilot plant in processing semitaconites will clear the way for economically processing the nonmagnetic taconites. There are enough of these to supply the whole world's steel industry for hundred's of years, he believes.

Presently, he believes, costs of processing semitaconites, by the Hanna method, will be higher than of processing magnetic taconites, although mining costs will be cheaper (because the rock is softer.)

'But,' he said, .perhaps the pilot plant may show a method of cutting costs.'

RICH ORES VANISHING

Hanna's six-story, galvanized-metal pilot plant sits on a wide reddish shelf overlooking Harrison Mine, a huge open pit 300 or 400 feet deep. In a half century it has produced millions of tons of ore. These are rapidly diminishing, but plentiful supplies of semitaconite are about.

Ore comes into the plant via a rubber conveyor belt, passes over a series of screens. Larger chunks go to a crusher to reduce it to a uniform size. Then the sized material goes into a water-filled vessel containing finely ground ferrosilicon. The ferrosilicon is lighter than iron-rich chunks, but heavier than silicious waste.

Thus, the high-grade ore sinks, the silicious material floats. The high-grade material is ready to ship without further processing. However, the waste or tailings, along with other ore material, goes into a gas-fired rotary Lurgi kiln, merely an 80-foot long tank which is seven feet in diameter, which revolves at seven r.p.m. Gas for it is produced from coke.

Mr. Erickson points out this is merely a small-scale plant, and if a full-sized one is built, the Lurgi kiln will be at least 200 feet long, three or four times this size in diameter. Here as the kiln revolves, the material is "roasted" to 1300 degrees Fahrenheit.

This changes the nonmagnetic material into an artificial magnetite. The ore then is quenched in water. Other conveyors carry it to rod and ball mills, merely huge revolving tumbling barrels containing piles of heavy steel rods or steel balls. These, in revolving crush and pulverize the material into a fine powder, as soft as face powder. Magnetic separators pick out the iron particles. These then may be rolled into ordinary taconite pellets. **—Christian Science Monitor**

Moving Sidewalks

TACOMA, Wash. — This city was one of the first to go into the power business, and now it's experimenting with moving sidewalks.

The first of four 'escalades' began carrying pedestrians up and down the downtown Tacoma hillside late in February.

Because the terrain is not unlike that of the south face of nearby

Mount Rainier, the pedestrian movement in the central business district always has been a problem.

San Francisco-style cable cars were tried for a time early in the century, but they were shortly doomed by economics and traffic congestion.

A shuttle bus now traverses the slope, but comparatively few are willing to spend a dime for the luxury of a two or three-block ride.

So in 1958 Tacoma voters approved a bond issue for civic improvements which included $850,000 for sidewalks that move.

Pacific Avenue, centre of banking and site of major office buildins, is at the foot of the downtown hillside. Broadway, hub of department store and other retail activity, is two blocks to the west, up the hill. Commerce Street lies between.

The city has acquired the necessary right-of-way segments in this area.

One building has been demolished, another will be, while the escalades will be constructed through two other structures.

The escalades are moving, nonskid rubber, belts, 42 inches wide and approximately 100 feet long. Equipped with handrails and safety devices, they will move up and down the hills at an angle of about 11 degrees.

The escalades are being installed in lighted tunnels.

From work already done, it appears the city will hit its original $850,000 estimate just about on the nose, according to city manager David Rowlands.

Both Rowlands and Mayor Ben Hanson feel the moving sidewalks will have sufficient curiosity and convenience value to more than repay their cost by helping revitalize the central business district.

Already there is talk of extending the ramps two more blocks on up the hill, to Tacoma Avenue — the city's civic centre. A million dollar item for the extension appears in the city manager's new six-year capital improvement program. **—North American Newspaper Alliance**

Plug-In Teacher

WASHINGTON—Suppose you could hook up a teaching machine to an electronic computer, plug in a student, and turn on a switch.

How much would the student learn, and how fast?

Much more and much faster than ever before, says Prof. Edwin McClintock of the University of Illinois.

He says the process 'combines the best of the teaching machines, the best of the computers, and the best of the student-teacher relationship.'

HOW IT WORKS

Here is how it would work:

A program of instruction in mathematics, for instance, would be broken down into tiny bits and pieces of knowledge designed to lead the student to mastery of the subject at his own speed.

The program of instruction would then be fed into an electronic computer on tapes, films and sound tracks.

Next, the student would be plugged in by attaching a device, similar to a lie detector, to his arm.

With a flick of a switch, the machine would begin to present the material on one of several small screens facing the student.

On another screen, a professor's face would be seen as he discussed the material, with his voice coming from a recorded tape.

FEEDS ROLL BACK

Once the problem had been presented, the student would begin to work it.

He would do his work on a roll of paper which would be fed back into the machine.

Since there are now electronic computers that can 'read' numbers and letters, the computer could keep track of the student's progress.

If the student got bogged down, the machine would take note and a recorded voice would say, 'Look, you need some help. Why don't you go see Professor Jones in Room 763?'

The computer might ask him, on the other hand, 'Have you forgotten such-and-such a step?' or 'Didn't you put the decimal point in the wrong place?'

'TAKE A BREAK'

And if the device on the student's arm indicated he was flustered, the machine would say, 'Here, let's take a break for a minute or two.'

While the student leaned back in his chair, soft music would be played to ease his tension.

One of the idea's big advantages, McClintock says, is that it would give the professors more time. **—Canadian Press**

Electronic Check Sorters

BOSTON, Mass.— A roomful of machines chattered to each other and to the people running them as they processed a mass of checks. Actually, it was difficult to tell who was running whom.

The people 'running' the talkative machines — employees of the Federal Reserve Bank of Boston — stood by as the machines did most of the work. They seemed slightly awed, realizing all they had to do was get the machines started, then wait for the machines to tell them when mistakes occurred.

The Federal Reserve System, struggling for air in the rising flood of paper, is testing new automated equipment for handling checks here and in four of its other district banks in the United States.

COMPLICATED DEVICES

This is rather sophisticated equipment.

After 'reading' and sorting the checks the electronic chatterboxes endorse them, then prepare a report on their complications. All the

while they keep a wary eye to assure there is no funny business, such as forgery.

As they relieve humans of mechanical toil, the machines humanly demand good working conditions. The room at the Boston bank is sound-proofed and air-conditioned.

Controlling the operation is a National Cash Register computer which remembers everything it has been told by another machine, the card reader. The human operator instructs the computer through the card reader.

Other machines are the printer and lister, the check sorter, a console, and a monitor, really a typewriter, through which the computer tells the operator when a mistake is made.

TESTS IN OTHER AREAS

The Federal Reserve System is evaluating equipment of other manufacturers at district banks in New York, Philadelphia, San Francisco, and Chicago to determine which is best suited for the various district banks.

A Federal Reserve Bank is a busy place. On a normal day 1,300,000 checks flow into the Boston District Bank from its member banks and branches in the six New England states.

Under its present system the Boston bank each day keeps busy three shifts to make certain no check is held overnight. Each of the millions of checks received by the bank must be examined individually by an employee who determines to which bank it should be sent.

The average human operator, using present equipment, clears about 20 checks a minute. The new machines whizz through 750 a minute.

Present bank employees are training to operate the new equipment, according to Charles E. Turner, vice-president in charge of check collection. No employees will be laid off as a result of transition to the automatic equipment. However, the bank will hire fewer new employees as it reduces its staff over the next several years.

MAGNETIC INK

Base of the new automation system are characters printed on the check in magnetic ink which can be read by machines as well as people. Use of the characters recently was adopted by the American Bankers Association as a 'common language' for bank automation.

Already over half the commercial banks in the United States have begun to prepare their checks for electronic handling, according to a recent survey by the Reserve System.

One machine, the printer-lister, emits an occasional croaking sound as it records the work of the other machines. Maybe there is a frog in the machine which does the typing, one thought.

—Christian Science Monitor

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* LONDON—Japan last year retained the position it has held since 1956 as the world's largest shipbuilder. It launched vessels totalling 1,725,000 tons in 1960, Lloyd's Register of Shipping reports.

Britain, which in 1959 moved back into second place after being ousted by West Germany, produced 1,324,000 tons of shipping in 1960 to retain its position. West Germany stayed in third place with 1,101,000 tons.

The figure for Japanese production represented an increase of 2,000 tons over the previous year. The British figure was down by 49,000 tons and the West German one dropped by 101,000 tons. **—REUTERS**

* WASHINGTON—Electronic hog butchers and automatic hotdog machines may leave many persons unmoved, but they are a 'haunting spectre' for at least 350,000 members of the AFL-CIO Meat Cutters Union. Patrick E. Gorman, secretary-treasurer of the union, told a House labor subcommittee that automation has caused shutdowns of plants in the Chicago area that have eliminated 20,000 jobs since 1940.

Possible solutions, he suggested, would be a shorter work week, re-education programs and ending corporate tax benefits for certain plant shutdowns.

—UNITED PRESS INTERNATIONAL

* OTTAWA—Imported textiles cost 35,000 jobs in the Canadian textile industry last year and the situation is going to get worse unless something is done, the Senate committee on manpower was recently told.

A brief from the Primary Textiles Institute said foreign-made fabrics are already outselling Canadian products in the Canadian home market. If the present situation continued, another 14,000 textiles workers would be out of jobs by 1970. M. W. Berry of Montreal, president of the institute, said textiles from Japan and Hong Kong are crippling the Canadian industry. **—CANADIAN PRESS**

Our Dwindling Waters

Alarm over the water problem is being belatedly expressed as for the first time North America outpaces its dependable water supplies. Desalting the sea is one unrealistic, commercial scheme being considered to meet deficiencies.

AIR AND WATER are two essentials to life on this planet. Without either or both, life would be impossible.

The air we breathe, although badly polluted in many areas, is an abundant commodity, and there seems to be no likelihood in the foreseeable future of its becoming difficult to obtain. Unfortunately, the same cannot be said of our fresh water supplies. A minority of people have for many years expressed concern over the problems of our rapidly depleting, polluted waters. Dr. Paul Sears of Yale and other leading ecologists have been warning us about the danger to civilization inherent in a falling water table. W. H. Carhart in his book 'Water or Your Life' pointed out the dangers facing North America caused by the abuses to our rivers and forests, and our failure to practise conservation on a large scale. Educational films have in a limited way attempted to inform the people of this Continent of the dangers to their water supply.

Much of this information has been of little avail; the general public either did not care, or was too apathetic to concern itself with the problem. The experts were called alarmists, cranks and eggheads. 'Water scarce or likely to become so? Nonsense! There has always been plenty of water.' So has been the attitude of the general public. They act as if pure palatable water in unlimited quantities is a birthright that will always be available no matter how they waste and pollute. Dallas, Texas, is already pumping water from the salt-tainted Red River. During a particularly hot summer a few years ago, residents of Dallas had to queue up to buy cardboard containers of water for their daily use at a price double that

of gasoline. During 1957, the most recent year surveyed, about 1,000 communities contraining 1/7th of the entire U.S. population, were on short water ration. Citizens grudgingly agreed not to water their lawns, wash their cars, or fill their swimming pools. In spite of this, few Americans ever think twice when they turn on their faucets to use their share of the 315 billion gallons of water that splash into homes, factories and over farmland each and every day. But New York City faces the possibility of purifying the polluted Hudson River to slake its growing thirst. Mississippi wells are now over 400 feet deeper than they were twelve years ago. Chicago wells flowed under their own pressure 100 years ago. Now, most go down over 2,000 feet to reach the water table. Today we have over 35 million bathrooms, millions of dishwashers, washing machines, car washers, lawn sprinklers, et cetera. It takes 20 to 30 gallons of water to run a washing machine or to take a shower. Industry is even more gluttenous. It uses 25 gallons of water to turn out a pound of paper; 65,000 gallons to make a ton of steel; 660,000 gallons to produce a ton of synthetic rubber. A modern oil refinery uses as much water as a city of two million people. To produce a gallon of alcohol requires 100 gallons of water. The demand for water is continuing at an alarming rate. As industry continues to exploit more markets, as it continues to attempt producing and selling more commodities, the increasing use of more and more water will result. Industry is today using over half as much water again as in 1952.

Business enterprise is concerned only with the expansion of its markets as a means of making bigger profits, not with the conservation of water resources. Waste and inefficiency add to this — the duplication of many enterprises manufacturing the same commodities; the constant production of inferior merchandise which quickly deteriorates and must be replaced; and the indiscriminate pollution of rivers and streams by industry, regardless of the far-reaching and

disastrous effect on future water supplies.

Typical of the type of vision and planning which motivates business interests was a prediction made by S. L. Curlett, President of National Swimming Pool Institute, early in 1959 in foreseeing '52 million private swimming pools by 1982.' This may be all very nice for the U.S. swimming pool industry, and people may be able to afford it financially. Hydrologically, though, the cost would be exorbitant.

As previously stated, thinking men have long warned of the impending water shortage which would result from the tremendous consumption and wastage of this vital resource. Now the situation has become so critical that even some of the politicians are becoming aware of it. In 1960, the U.S. reached a crucial point in its history when for the first time it outpaced its dependable water supplies. Consumption surpassed these supplies at a rate of eight billion gallons daily.

A recent staff report of the House Committee on Science and Astronautics states the problem cogently: 'The United States will be the first of the highly civilized technologically advanced nations to find itself in real difficulty due to fresh water shortages. This difficulty will materialize *as much as ten years earlier than the 1980 date set by most prognosticators, that is, by 1970 or before.*' The big hope being held out by the politicians, businessmen, and their supporters, to ease the water shortage is the desalting of the sea. This is typical of the thinking and so-called planning which one should now expect from the administrators of the Price System. The desalting of the sea, for the purpose of obtaining fresh drinking water, is fraught with problems.

There are three main methods by which desalting can be achieved: distillation by means of artificial heat or by solar heat; electrical conversion; or by freezing. Distillation by artificial heat would be extremely costly energy-wise. Discounting the dollar price, the original heat would come from oil, coal or natural gas. These fuels would be needed in tremendous

quantities and are themselves important irreplaceable natural resources, the rapid depletion of which is already causing grave concern among those who concern themselves about such things. The use of solar heat is not yet a practical possibility. Research into the subject has been much neglected and heating by solar means on a large scale cannot be considered at this time. Electrical conversion, a means of ionizing the salts and screening them out would be another energy-expensive means of desalting if carried out on a large scale. The freezing of salt water and the separating of the salt crystals from the ice crystals, then melting out the fresh water, is the least expensive process from an energy standpoint since it takes less energy to freeze water than to heat it. Even this method, however, would entail too great an expenditure of energy to justify the results obtained.

Other problems would arise. There would be the need to pump the sea water up to the processing plants, and then to distribute the fresh water to the eventual consumers many miles inland. What to do with the tremendous amounts of salt remaining after the desalting process? Salt is already in plentiful supply and therefore one of our cheapest commodities (approximately nine cents a pound). Impurities in sea water make it unsatisfactory for most commercial use. These impurities also lead to clumping. Salt freshly produced from sea water evaporation ponds may contain large numbers of halophilic (salt loving) micro-organisms. These occasionally cause spoilage to meat, fish, vegetables and hides when salt has been used in the preservation process.

Of course, the great energy costs and other problems related to the desalting of the sea are incidental to the politician and businessman who have little regard for the future welfare of North America and its citizenry. What really makes the proposition so attractive to them is the prospect of extensive new markets opening up. Methods are being tested for home units of electrical conversion units and freezing units for sale to customers both here and abroad. What an opportunity! Water for

sale on a commercial basis and absolutely essential to all life! But what really excites them is the fact that the oceans of the world are tremendously rich in mineral content, and the idea of exploiting these is the main motivation for research into the matter of desalting.

From one square mile of ocean 89 feet deep can be found the following rich array of mineral content: 2,140,000 tons of sodium chloride, market value $33 millions; 118,000 tons calcium chloride—$2.5 millions; 48,000 tons magnesium—$33 millions; 1,450 tons iron—$17,000; 139 tons aluminum—$60,000; and 9 tons copper—$6,000. Many others exist in varying amounts. In a cubic mile of sea water is contained some $25 millions worth of gold. All that has prevented the exploitation of these resources has been the high cost of extraction which renders the venture unprofitable. Now they are pinning hopes on atomic energy, but this raises further problems. The use of nuclear energy is not an economical or satisfactory proposition at this stage, and its use on a large scale would probably create more problems than it would solve. At this time the United States are holding approximately 65 million gallons of deadly radioactive waste, and by 1980 will have accumulated 65 million gallons more. Even at today's limited rate of usage there appears to be no safe way of disposing of wastes. All that can be done is to hang onto them and hope that no accidents occur to release their radiation dangers.

The desalting of the sea would not and cannot solve the serious water shortage now facing the United States but which will eventually become a problem for the whole Continent. In all probability, the desalting would create many more problems.

What, then, is the answer? In its blueprint and design for the functional operation of North America, Technocracy Incorporated has drawn up specifications for the application of a technological water control. The lakes and rivers of North America are so situated as to provide the greatest opportunity existing on the face of the globe for harnessing of all waterways into a Continental Hydrology.

The Continental Hydrology proposed by Technocracy would prevent many abuses such as the overgrazing by livestock which destroys ground cover and allows a fast runoff of water and resulting erosion; and the denuding of our forests which causes water to rush down the slopes so that little is caught and held to sink into the ground. The excessive usage of water both by individuals and industry due to wasteful Price System practices would be eliminated. Water would be treated as the precious resource it is, and conservation would be practised.

A Continental Hydrology would introduce climatic changes, increase local precipitation, and raise our badly depleted water table over large areas, rendering possible the reclamation of waste lands and the prevention of desert expansion. It would create large reservoir lakes in such areas as North Dakota, Montana, Saskatchewan and Alberta, now considered arid. In addition to providing abundant supplies of fresh water, it would make possible a development of hydroelectric power development considerably increasing all present Price System engineering estimates of power production. An abundance of energy would be released without the loss of vital irreplaceable resources. The Hydrology would permit the transportation of bulk material at an energy cost of 1/11th per ton-mile of that of railroad freight haulage from presently inaccessible areas to future areas of fabrication and use. This is another example of the conservation of energy forms for future use as contrasted with today's wasteful methods.

The Continental Hydrology, briefly outlined here, is the scientific solution to North America's water problem. All of the many other problems plaguing North America's Price System can be solved by a similar application of the scientific method.

—John C. Darvill

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* OTTAWA—Consumer debt jumped 8.4 per cent to $1,738,900,000 in 1960, the bureau of statistics reports. The survey covers finance and loan companies and department store accounts. —CANADIAN PRESS

Research For Tomorrow

Our industrial society is strictly a product of scientific research. As a result, North Americans stand at the threshold of a new era of abundance. Across that threshold awaits the Technate of North America.

IN THE YEAR 215 B.C., a Roman army and fleet attacked the Sicilian city of Syracuse with every expectation of an easy victory. Instead, it was utterly defeated and completely demoralized — but not by a superior use of the conventional weapons of the day. Giant catapults hurled quarter-ton boulders against the Roman galleys, while cranes at the water's edge up-ended, hoisted and flung back into the sea any galleys which came too close to shore. These ingenious devices were created by Archimedes.

While his destruction of the Roman 'task force' rates amongst his most spectacular achievements, it is not so important for its military success as for its demonstration of his applied use of leverage. His discovery of this along with certain other basic physical principles have earned for Archimedes the title of father of experimental science. Most people are familiar with the story of the overflowing bathtub which revealed to him the principle of displacement, the significance of which allegedly prompted him to run naked through the streets of Athens yelling 'Eureka!' ('I have found it!') Likely less well known are his numerous contributions to the field of mathematics which he raised from the realm of mental entertainment to practical application.

His contemporary, Eratosthenes, combined mathematics and astronomy in learning the shape of the earth and its size. Considering the rude implements at his disposal, he calculated these with an amazing degree of accuracy. Unfortunately, the objective observations of these men were largely lost to the world of their time and were submerged in a wallow of ignor-

ance and superstition for another sixteen hundred years.

Around the mid-15th Century A.D., the next significant efforts to lift mankind out of its cultural abyss were made. Several ancient Greek findings were re-discovered by the same objective processes as Archimedes and Eratosthenes had employed. The knowledge of the earth's roundness, for instance, was re-established. Copernicus learned anew that the sun rather than the earth was the center of our planetary system. These rediscoveries, however, merely marked the beginning of a new age. Other disclosures, apparently unknown to the Greeks, were made and gradually accumulated into such a volume of incontrovertible knowledge of the physical world as could not be ignored, despite the customary and sometimes violent opposition. Contributing to the establishment of basic principles which would have the most profound social effects when applied in later generations were Leonardo da Vinci, Galileo Galilei, Robert Boyle and Francis Bacon. The distinctive method of operation used by these and other investigators was given definition by Bacon as that systematic procedure which we know today as research.

This procedure is described by the American People's Encyclopedia (1956) as 'a systematic approach which aims to define and to solve problems already known; or to explore areas projected into the unknown where problems have not become sufficiently crystallized to be defined. The approach is essentially that of the scientific method . . . Although research may be carried on in any of the innumerable fields of human activity, the greatest progress has been made in two dissimilar types of activities: (1) in dealing with pure science and (2) in dealing with the practical problems arising in such fields as education, industry, commerce, transportation and warfare.'

Bacon may not have defined the procedure as broadly as this, but as it became more generally recognized and received greater application, the volume of successful results correspondingly increased. Such research techniques revealed to Sir Isaac Newton in 1666 the component

parts of light as reflected in different colors through a prism. His experiments in this field made him one of the founders of modern optical science. He also worked out the laws governing color production. Daniel Bernoulli determined the characteristics of air which led 150 years later to the development of aircraft. Benjamin Franklin conducted experiments which proved lightning to be a manifestation of electrical energy; and Joseph Priestley succeeded in dividing natural air into its component gases.

Some of the gathering results of research techniques simply added to the general store of scientific information for later use, while others were put into almost immediate application. Prominent among these latter was James Watt's steam engine which, vastly improved over the earlier Newcomen model, made the Industrial Revolution possible. This event, one of the most significant in human history, was strictly a product of scientific research and could not have occurred until a sufficient background of knowledge of the physical world had been accumulated to sustain it. Watt's engine was the culmination of that necessary volume of knowledge.

The Industrial Revolution prompted a rapid acceleration in scientific research. Starting as it did at the end of the 18th Century, most of the speed-up occurred in the 19th Century, but nevertheless a great contribution to industrial development took place before 1800.

Eli Whitney is remembered mainly for his invention of the cotton gin which was designed to clean the lint from greenseed cotton. Much more important was his development of those mass production techniques on which present high-speed technology is based. It was he who conceived the idea of making all component parts of an article identical to each other in large numbers. This allowed the necessary interchangeability of all components for fast final assembly. The application of this scheme in the production of rifles played an important part in defeating Burgoyne's British forces at the decisive Battle of Saratoga, and in the eventual winning by the

American colonists of the Revolutionary War.

Scientific research surged rapidly forward during the 19th Century. Joseph Henry developed the industrial electromagnet which Michael Faraday subsequently used in his development of the first electrical dynamo. After them came Westinghouse with new techniques for hydroelectric power production; Edison with electric light and phonograph, to mention only two of his numerous inventions; Bell with telephone; Marconi with wireless long-distance communication; Diesel with the engine named for him; Roentgen with the X-ray; and Pierre and Marie Curie with the discovery of radium. All of these advances and many more were the result of systematic scientific research.

It will have been observed so far that individual researchers are credited with the discovery or development of various phenomena. In some cases, to be sure, scientists who were interested in the same work had pooled their intellectual (and financial) resources for the solution of specific problems; but for the most part their efforts had been conducted on a lone-wolf scale. It will also have been noticed that there was considerable overlapping in certain aspects of work — as in the various fields of electrical research. This was inevitable as the volume of knowledge of natural laws increased and were applied industrially. Industry grew so fast as the result of these innovations that its needs soon exceeded the capacity of individual researchers, and thus gave rise to the next phase of growth.

Towards the end of the 19th Century some firms commenced establishing research laboratories upon their own premises to cope with production problems specific to their needs. Here was the beginning of organized research involving groups of trained scientific personnel directing attention to definite objectives. By the start of this present century organized research had advanced sufficiently to convince the major firms of the importance not only of maintaining research staffs but of expanding their facilities. Accordingly, about two-thirds

of present North American industrial research is sponsored by some 250 companies — the balance being spread out thinly through thousands of others. While the actual number of researchers has been relatively small in comparison with the total population, the results of their combined work have had a phenomenal impact upon this Continent's Price System economy.

The early stages of organized industrial research (which overlapped the era of individual research) was mainly directed to the task of improving methods of production and the qualities of produced goods. As the effectiveness of such research became more evident, it was learned that these two objectives were not compatible. To improve both could only result in a volume increase of production on the one hand and a drop in sales on the other. Therefore, while improvements continued to be sought in production methods in order to cut operating costs, much research effort was otherwise expediently directed toward *decreasing* goods quality in order to increase the frequency of sales. This has been and remains (at an intensified rate) a deliberate but necessary perversion of research to maintain the Price System. An interesting facet of this perversion is that of the need in many instances to devote considerably more research to the development of an inferior product than to that of a superior one.

Technocracy points out that the misuse of scientific research stems directly from the inability of the Price System to cope with the problem of distributing the abundance made possible by the application of research. Once again, Technocracy states that in order to achieve the maximum benefit from research, a social program specifically tailored to the requirements of an environment of abundance must be instituted. Such a program is the social blueprint of Technocracy, itself a product of extensive and intensive research.

Research would, in a Technocratic society, assume one of the most prominent and responsible of all functions. Its work would be carried out through the special Sequence of Continental Research, described as fol-

lows in the *Technocracy Study Course:*

'In every separate Sequence, Service Sequences as well as Industrial Sequences, it is necessary, in order that stagnation may not develop, to maintain an alert and active research for the development of new processes, equipment, and products. Also there must be continuous research in the fundamental sciences — physics, chemistry, geology, biology, etc. There must likewise be continuous analysis of data and resources pertaining to the Continent as a whole, both for the purpose of coordinating current activity, and of determining long-time policies as regards probable growth curves in conjunction with resource limitation and the like.

'The requirements of this job render it necessary that all research in whatever field be under the jurisdiction of a single research body so that all research data are at all times available to all research investigators wishing to use them. The chief executive of this body, the Director of Research, is at the same time a member of the Continental Control, and also a member of the staff of the Continental Director.'

It is evident from this that the role of research in the Technate will be to improve the living standards of all citizens in all respects without jeopardizing the welfare of future generations. This correctly infers that optimum quality will be built into all commodities and that major emphasis will be placed on the conservation of irreplaceable natural resources.

These resources have suffered serious depletion through Price System predation. The conservation of those surviving the demise of the present economy will present some problems whose solution must be provided by scientific research. One such problem might be that of developing substitutes from replaceable resources — such as various forms of vegetation — to take the place of materials presently made from dwindling irreplaceables. Where no such substitution is possible or satisfactory, research must find ways to make the most advantageous use of irresplaceable resources—a consideration which

suggests reclamation for repeated utilization. There would be no such spectacle as the thousands of automobile junk yards now prevalent across the Continent in which mountains of iron and steel are permitted to rust away. Instead, once a vehicle had outworn its use it would be dismantled and its metal melted down for re-use.

The removal of Price System restrictions will enable Continental Research to find answers to many long-puzzling questions. In the realm of medicine, for instance, it would be able to concentrate its undivided attention on problems which have thus far defied solution. Some such problems would be the finding of cures for cancer, tuberculosis, poliomyelitis and even the common cold.

It is known that some diseases result from dietary deficiencies and that they will respond satisfactorily to the alleviation of such deficiencies. Here the work of medical research dovetails with that of agricultural. If it is the work of medical research to establish what nutrients are necessary to maintain human health, it is the work of agricultural research to learn how these nutrients can be supplied in adequate quantity in all foods to assure a high average health standard for all North Americans. Thus would be ended the paradox of people being nutritionally starved even when they have been consuming regular and hearty meals.

The above instance of the merging of two seemingly unrelated phases of research illustrates the manner in which all phases might be similarly linked, and demonstrates why all research work must, in order to achieve maximum effectiveness, be coordinated within one body. When it is realized that each of the 90 to 100 industrial and social sequences set up to run North American facilities will have a branch of the Continental Research within its operation, the scope of this special sequence's responsibility will be partially appreciated. More than any other sequence, its decisions will determine the pattern and future course to be followed within the Technate. It will naturally be subject to the direction of the Continental Control which will determine *what* must

be done to provide the physical needs of the populace. Continental Research will determine *how* it will be done.

The manner of accomplishing this is exemplified by the manufacture of textiles. Research will through its close association with the textile production plants know exactly what types of materials are being produced and how well their qualities are adapted to intended uses. Production facilities will also be fully familiar to the research staff. When they have developed newer fabrics of sufficient superiority over the old to warrant production, they will recommend a change-over to the new. Similarly they may recommend the replacement of old equipment with more efficient new equipment.

The change of emphasis in Technate research will be in marked contrast to most of that conducted by Price System industry. Built-in obsolescence, so common today as to be accepted without question, would become a relic of the past. Instead, there would be a return from this perverted use to the original purposes of research — both basic and applied. Basic research, badly neglected in recent Price System history, would receive strong new impetus in the Technate's objective to learn increasingly more about the physical world and its inhabitants. Applied research would be able to unshelve many inventions and scientific developments already in existence which have not been put to use for fear of the likely disastrous effects they would have had on the Price System, but which would otherwise be socially beneficial.

It is difficult to imagine any physical operation which has not benefited by the application of research techniques. This is so even within the Price System which is reeling like a punch-drunk boxer under the repeated blows of research-born technology, despite the the lack of Continental organization or definite social objective. Since the very character of the Price System precludes such wide-scale organization, the effectiveness of research must be correspondingly restricted within such an economy. Only within a society which has removed monetary restrictions can the

full benefits of research techniques be realized. The social blueprint of Technocracy provides for the removal of these restrictions.

The degree of progress achieved by Continental Research within the Technate will be determined principally by the number and quality of available persons who can be trained for research work. While the solution of this problem will be mainly that of Education Sequence, it is probable that Continental Research will aid in developing new and more effective methods of teaching. Naturally, those students who display research aptitudes will be specially observed as to progress, and, if their calibre is suffciently high, they will be invited to the Continental Research staff at the end of their formal educational period.

The selection of outstanding students will be only one of the channels employed by the special sequence to obtain research personnel. In addition, it may select personnel from all other sequences whenever any functionary displays the necessary qualifications. This will not be done indiscriminately, but on the strength of demonstrated above-average functional competence. Because Continental Research will therefore comprise the cream of the functional crop, an appointment to it will be one of the highest marks of social prestige that any citizen can receive. Appointments to it will likely be widely sought, but will not be granted merely for the seeking. Where the only criterion for promotion will be that of superior ability, most people appointed to the Continental Research will not have asked to be appointed. Their own proven competence will be their sole and sufficient recommendation.

North Americans stand at the threshold of a new era of abundance. If they are to survive the end of the Price System era of scarcity, they must take the next step forward across the threshold into the Technate of North America — the economy of abundance made possible only by research.

—Rupert N. Urquhart

Lifeguard's Lament

Once upon a time a Ratepayers' group wrote to the Park Board saying: 'We request the Park Board to provide an additional life-guard at the Lake this coming season, same being badly needed.'

After two weeks the Ratepayers' group received this reply from the Park Board: 'Your request for funds for an additional life-guard at the Lake this summer has been passed on to the Municipal Council which, as you know, has reduced our Park Board budget for this year.'

A month later the Park Board received this reply from the Municipal Council: 'Owing to the worsening of the municipality's financial situation, due to the increased share of school costs which are now being placed by the provincial government on the municipality, we are unable to undertake to review the Park Board budget. We have passed your letter and the enclosure on to the provincial government.'

Within six weeks the Municipal Council received this response from the Provincial Government: 'Due to the inequitable basis upon which the federal government shares tax revenues with the provincial governments we are unable to consider your request, which we take to be for a re-appraisal of provincial-municipal g r a n t s. However, we are passing your letter and enclosure along to the federal administration.'

After two months the provincial government heard from the federal government as follows:

'Our government is unable to entertain your proposal, which we believe calls for a revision of federal grants to provinces. We draw to your attention the increased gravity of the international situation, together with the rapid extension of the degree of attention which we must give to interplanet rocketry.'

Moral: There is more future for politicians than for lifeguards. *—Barry Mather in Vancouver Sun*

$14 Million Squandary

EDITOR'S NOTE: The following news despatch gives some idea of the amount of money being spent on arms expenditures, but creates an erroneous impression of what would result if the same amount were turned to peaceful purposes. Bluntly speaking, it would, through the release of several million persons onto an already glutted labor market and through the building of even greater surpluses, wreck the North American Price System. Since this is the last thing the champions of this economy wish, we need not expect any decrease in arms expenditures in the foreseeable future.

WASHINGTON (AP)—The world is spending $330 million a day—$14 million an hour—on arms and armies.

In sum, mankind is spending at least $120 billion annually to preserve its respective hunting grounds inviolate — or for the ultimate purpose of encroaching on those belonging to others.

The United States and the Soviet Union together spend about 73 per cent of the total, or $88 billion.

The arms race is costing the world $40 a year for every man, woman and child now living.

If the world were to collect all this money into a common pool for peaceful purposes, the average annual cash income of every Chinese, Indian and Pakistani — 1.2 billion people who net less than $100 each year — could be more than doubled.

Adequate housing could be provided for 240 million families now living in underdeveloped nations. It wouldn't cost much. In some places houses are being built for as little as $375 to $500 each. The money goes for material only.

The hungry among the world's 3 billion people could be fed, the sick provided with medical care.

An absolute end to the arms race would release the constructive energies of at least 15 million men, now in training to kill each other.

This, however does not tell the whole story. A rule of thumb is that at least four men must labor to keep one soldier armed, fed and supplied.

Thus, an end to the arms race would enable another 60 million men to turn to the task

of beating swords into plowshares.

An uncounted number of scientists, now bending their brains to bigger and better means of mass destruction, could turn their thoughts to the stars or dig into the secret of life.

The United States is spending $46 billion annually for missiles, manpower, tanks, guns ships, atomic explosives and military aid to allies.

That is 55 per cent of the federal goverment's total budget. It is roughly 9.2 per cent of the United States' gross national product — income from all sources for everybody — which now is about $500 billion annually.

Official Russian figures set arms spending at $10.2 billion annually out of a total budget of $86 billion.

The Russians, however, conceal military expenditures under such headings as 'heavy construction' and 'scientific experiments.'

Analysts estimate that a more accurate figure would be about $42 billion.

This is about 49 per cent of the total Russian budget and roughly 12 per cent of the $380 billion gross national product.

—Bem Price

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* VANCOUVER—Lack of work forced two youths to remain in the New Haven correctional institution last year for two months after they were eligible for parole. The boys, who have since been released, could not meet parole board requirements because they were unable to find jobs and had no families to support them.

Malcolm McCaw, executive director of the B.C. Borstal Association, revealed this in his annual report. 'This is the first time I can recall that we have been forced into a situation like this,' he said, 'and it was caused by the desperate unemployment situation.'

—VANCOUVER SUN

* MAN STILL OUTNUMBERS the automobile in California, but the cars are rapidly catching up. At last count, the state's population was 15,717,204; its registered automobiles, 8,681,162. But new vehicle registrations climbed to 484,824 last year—well ahead of 360,770 babies born in the state during the period.

California man is also letting the auto overtake him in another way — by killing him off. The state reported 3,723 motor-vehicle fatalities last year.

* IT HAS BEEN CALCULATED that a $13,500 home, bought under President Kennedy's 40-year mortgage plan, would cost the buyer $33,437 by the time the place was paid off. This may strike some people as high, but then again that $33,437 may be worth only $13,500 by the time 2001 A.D. rolls around. —WALL STREET JOURNAL

* THOUSANDS OF NORTH AMERICANS will die of gas this year. Some will inhale it, others will be blown up by it . . . but most of them will just step on it. —ANONYMOUS

Through the Technoscope . . .

Technocracy examines the various scientific and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

Science and Technology

HI-PRESS AIR CONDITIONING OF America, Inc. will offer a version of its small-pipe, high-pressure air-conditioning system — originally designed for ships — to office buildings, apartment houses, and factories.

The system uses much smaller diameter pipe to carry air than conventional low-pressure systems require; and it does not require water pipe, fans or motors near the individual room units as do other high-pressure systems on the market. All heating and cooling is done at the central station, and the conditioned air is carried through narrow pipe (5½ inch down to 2½ inch in diameter) to the room outlets where it is blended to the right temperature.

GEORGIA-PACIFIC CORP. HAS DEveloped a new method of making plywood that eliminates several production steps and brings the manufacturing operation much closer to a continuous process.

Ordinarily, plywood manufacturing requires at least five steps: peeling the veneer, curing it, cutting it to size and repairing defects, wet glueing, and pressing. Georgia-Pacific's process combines these in about two steps. The green veneer is fed directly to a four-storey press where dry glue is dumped on it; then it is heat bonded, which simultaneously cures the green veneer and sets the glue. In addition, the surfaces are covered with resin impregnated paper which cures to a hard plastic-like coating. That eliminates the sanding operation, provides a paint base, and eliminates grain rise and cracking.

The product, says G-P's vice-president of research, has all the qualities of premium plywood yet is made from lower-quality veneer.

A NEW VIBRATION DAMPING tape called Scotchfoam has been placed on the market by Minnesota Mining & Mfg. Co. It is made of polyurethane foam with adhesive on one side and plastic backing on the other. The tape, which will stick permanently to metal, can be used to quiet vibrations and other extraneous noise on all kinds of machinery and equipment, from jet aircraft to home appliances.

A DOCTOR CAN GET AN INSTANT consultation with a heart specialist hundreds or even thousands of miles away with the help of a compact, lightweight electronic device that makes it possible to transmit electrocardiograms by telephone. The 6-ounce SONLINK transmitter, developed by Mnemotron Corp, of Spring Valley, N.Y., resembles a pocket transistor radio, is attached to the leads of an electrocardiograph and clipped to the telephone mouthpiece. The electrocardiogram goes out over the phone as a soft continuous beep that is recorded on another electrocardiograph for the cardiologist at the other end of the telephone line via a SONLINK receiver clipped to the telephone earpiece.

A NEW SMALL MAGNETIC DRUG memory for computers weighs only eight pounds but can hold six times as much information as comparable commercial drums, according to its manufacturer, Sperry Gyroscope Co. The drum's storage capacity is 358,000 bits of information.

A DEVICE THAT HOOKS TO THE front of photocopy machines eliminates most of the manual handling of these machines. It measures the original drawing or document, selects proper width copy paper from its own store, aligns the paper with the original and cuts it to size, then feeds the two through the copy machine. The manufacturer, Williams Automation Co., expects to find applications in engineering and architectural firms, insurance offices, and banks.

A SILICON RESIN DEVELOPED BY Down Corning Corp. makes it possible to encapsulate electronic circuits and components in a clear substance so that they can still be inspected visually. The resin, in the form of a nearly colorless liquid, is poured around the electronic parts where it hardens into a tough, flexible transparent mass which has good insulating properties and moisture resistance, according to Dow Corning. The material can be cut away with a knife, so that a defective part can be replaced; then the hole is filled with more resin.

NEW PACKAGING MATERIAL CONsists of polyethylene film laminated to burlap. The polyethylene is black, clear, or white, and the burlap is dyed various colors. Formed into tubing, it makes a protective covering for objects of most any size or shape, says its producer, Burlap Tubing Manufacturers, Inc. of Philadelphia.

* A MOTOR WEIGHING only one-ninth of an ounce and so small it can be hidden behind a thumb-tack has been developed to power small elapsed-time indicators and repeat-cycle timers. It is three-eighths of an inch in diameter and nine thirty-seconds of an inch long, consumes less than one-half watt of power, and is worth about 20 times its weight in gold.
—VANCOUVER SOUTH NEWS

Cosmonaut!

AT TREMENDOUS cost in technical effort, fuel and equipment, man has become an 'cosmonaut'. It makes a piker out of Jack and his 'New Frontier'. As for the folks who have been feeling a mite low because problems of our earthly environment seem to be multiplying and getting downright threatening, some are sure to find the escape hatch into the realm of fantasy has been widened.

We can expect this technological breakthrough to be treated much less as a scientific achievement contributive of useful knowledge to man than as an opportunity to be capitalized upon by every sensationalist and commercial opportunist. Space has been a rich preserve for fiction fantasy for decades, but the real fun is doubtless just to begin. Surplus population on earth? Don't go north, go out! Pioneer and populate other planets! Resource depletion? Why Mr. Moon is virtually in our back yard and he looks loded! Millions of lonely folks somewhere 'out there?' To your stations, missionaries! Don't let Africa frustrate you, try Venus! As for killing ourselves off, of course we can do it efficiently without leaving earth, but here's a chance to do it differently! Satellites, anti-satellites, and anti-anti-satellites, and no over-crowding!

As for you and me, brother, we're grounded to old terra firma. We might get up in the air sometimes but not for long and we don't go far. Billions of dollars poured into space programs aren't going to solve the problems of our earthly environment. So the intelligent thing to do is to learn more about the environment we're stuck with. You might even be surprised at the marvelous potential at our finger-tips, providing we act more intelligently than we have in recent years, that is! —*Milton Wildfong*

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

* Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elswhere.

* The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

* It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

* Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

* There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Panama, Puerto Rico and in numerous other places with the Armed Forces.

* Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

* Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundation of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

* Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

* Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American you are welcome in Technocracy.

TECHNOCRACY

'. . . A NON-POLITICAL FACT-FINDING BODY OF EXPERTS IN THE VARIOUS DEPARTMENTS OF APPLIED AND THEORETICAL SCIENCES, WHOSE AIM IS TO REVALUATE INDUSTRIAL OUTPUT IN TERMS OF ENERGY FACTORS.'

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TECHNOCRACY DIGEST

AUG. 61

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Automated Paperwork

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Charcoal From Sawdust

End of Toil

Through The Technoscope

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TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

AUGUST, 1961 **No. 181**

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Quarterly Survey

Never on Sunday

A facility that has been growing in popularity with housewives in many Canadian and U.S. cities in recent years has been that of the coin laundries. They have been reasonably economical by comparison with regular laundries, but the feature that has brought them into particular favour has been their round-the-clock availability throughout every week irrespective of Sundays or holidays. During bad weather especially, women have found it most convenient to drop in at a nearby laundromat and complete a washing in a fraction of the time they could do the full washing and drying cycle at home. Very often, even women with their own automatic equipment have turned in preference to the laundromats because they did not need to be concerned either about maintenance or the supply of hot water. Others who have worked during the week have found it handy to visit a laundromat either after work or on Sundays.

Now, in Canada, the Supreme Court has lowered the boom in respect to Sunday opening. On Monday, June 26th, 1961, IT handed down a learned ruling that it is a contravention of the Lord's Day Act for coin laundries to operate on Sunday. The reason? They are not an essential service! Just what an essential service is IT did not explain, but included therein apparently are such things as coin-operated telescopes, cigarette vendors and depot luggage lockers.

The ruling caught the British Columbia Legislature unawares, for the latter had only recently given the laundromats the green light for continuous operation. At this writing they are still running seven days a week, but it seems only a matter of time before the provincial government must obey the Supreme Court ruling.

This is one of the numerous absurdities that so well charac-

terizes Price System operations. Let there be no illusions about the reasons for the coin laundries wanting full-time opening. At each of them only one or two attendants are on hand for a few hours each day, and the rest of the time they are unattended (including Sundays), so pickings have been good. Be that as it must be within a Price System, they have in a relatively short time provided the type of continuous service which in a functional society must include all services. Just where the Supreme Court of Canada makes the fine distinction between what is necessary and what is unnecessary is rather obscure. Would it not seem, though, that when a facility has attracted as wide patronage as has that of the coin laundries that it might be accorded at least the same rating as a tourist telescope? Technocracy views this ruling as a good example of how political control interferes with physical operations.

The Cultural Revolt

The achievements of modern technology will be allowed to be used exclusively for the benefits of mankind, according to a recent prediction made by Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory at Harvard. Addressing a graduating class at Northeastern University, Boston, Mass., this leading American scientist stated that the cultural revolution 'has a potential for secure living and creative expression that is truly explosive.'

A few possibilities such as weekend trips from Boston to Tahiti were mentioned by Dr. Whipple, after which he emphasized that in the 'long evolutionary travel from amoebus to thinking being, man now has reached a crossroad that demands a decision. In view of modern scientific achievements the lack of global cooperation could prove catastrophic.'

He described war, racial discrimination and religious intolerance as 'truly absurd . . . in fact, plain crazy.' Man's instinct, he pointed out, to remain within the group whose cultural background matches his own and fight aggressively against external groups that seem different or threatening has been a major factor in the mastery

of his environment — 'indeed in his very survival. Now,' he asserted, 'it becomes a veritable hazard.'

These and other comments by Dr. Whipple indicate that he has some objective knowledge of the hazards facing the world. Is he as well informed on the particular brand of hazard facing North America as the result of the impact of abundance on our Price System economy? We would respectfully suggest, in case that he is not, that he hasten to make a thorough investigation of Technocracy and fully acquaint himself with his social responsibility and special qualifications arising from his scientific training.

Automation Protection

How ridiculous can we get?

It was recently pointed out (June 24th) in Business Week magazine that an agreement not to fire an employee displaced by automation has been written into a two-year contract negotiated between the American Cable and Radio Corp. and the Communications Workers of America. Instead, the employee(s) thus displaced will be otherwise employed at equal pay within the company.

The question arises: Why did the company install the automation in the first place? Certainly it was not for the purpose of increasing its operating costs, but this is the result which must come from such an agreement. It must be recognized here that a major reason for communications companies automating their equipment was operational, for the function had grown too large and complex for manual control. This, however, does not rule out the economic factors involved. On a long term basis, the automated equipment is not only far more efficient but also much less costly than that necessitating large numbers of human operatives.

The abovementioned two-year contract may run its course, but it is a safe bet that it will not be renewed. After all, in a Price System operation, human operatives are expendable but profits are not.

In Quest of An Ideal

If North Americans had their choice they would probably stick with the Price System; but since it is crumbling away, they must soon seek ideals that are far removed from money matters which have so far fascinated them.

SHOULD you ask random Americans what their individual ideal in life is, the answer, if honestly given, surely would be closely related to money. In fact, the American Ideal is so closely associated with money that it is adequately summed up in a current smart proverb: 'Money may not be everything in life, but it is way ahead of whatever is in second place.' This indicates the futility of trying to discuss ideals with Americans except in terms of money or economic advantage of some kind. The same is probably true of most other peoples, also, but we just apply it with more emphasis than most. So, it is appropriate that we begin our quest for an American ideal in the realm of economic affairs.

Organization leaders find it very difficult to get their members out to association meetings. This is true of workers, teachers, farmers, junior executives, etc. They have tried giving prizes for attendance, imposing fines for absenteeism, and using other means of persuasion without much positive effect. However, there is one exception to this pattern. That exception is when wages, salaries, bonuses, prices, or other financial consideration of direct concern to the individual is the chief subject of discussion. That is where the members' primary interests lie and where they are most attentive and vocal.

Government regimes and social systems are almost always evaluated by the individuals concerned in terms of the probable economic benefits to themselves. At the election polls, the voter usually votes what he thinks are his economic interests rather than some abstract ideal. The really big political issues in America are those concerned with some economic interest. Check the

most controversial issues in American history and see if that is not so.

The centering of one's aspirations in economic comforts is not strange considering the past history of the human race; for the goals and struggles of life have almost always been those related to economic survival and advancement. With reference to the great majority, this has been an overwhelming concern. Only economic aristocrats and bums could feign some interest in ideals other than those with a monetary base. Ascetics and beatniks are not so different as they may pretend; they are just more fascinated with the art of cutting the costs of keeping alive.

The American presidents and other politicians, as well as super-patriots of various affiliation, speak very reverently of 'freedom.' You would think from their words and tone that 'freedom' was some kind of aura of holy blessedness that distinguishes the Select people from the condemned. But you will not find them attempting to define freedom. The late John Foster Dulles used the word rather freely and loosely and, in certain references, included the Saudi-Arabians among the 'free peoples' of the world. When a reporter asked him at a news conference to define freedom, he stumbled around for awhile then blurted out that it meant 'free of communist influence.' To Mr. Dulles, freedom meant nothing more than non-communism.

Freedom, as the word is used in modern America, can have only one definition, and no 'patriot' wants to hear that definition voiced openly. To get at the definition, one must study the context in which it is most often used. It means simply this: Freedom is the privilege of the chiseler to trim the sucker. The suckers are the consumers and taxpayers.

In Free America, the politicians are on the side of the chiselers and against the consumers. The tax structure is so rigged that the big operators do not suffer from it, but the suckers are nicked from a hundred different angles.

There was a time when a certain American ideal was expressed with the slogan, 'Forty Acres and a Mule.' That was strictly an economic ideal. As a way of life, it had a certain appeal; for, forty acres and a mule spelled economic security to many people who did not have so much. This ideal was not limited in its attractiveness to only those who aspired to it for themselves, however. It presented a social pattern that was also highly satisfying to most of the big chiselers; for, it would tie down millions of citizens to a way of life that would border on serfdom. It would keep them scratching for the necessities of life; and it would immobilize them on a certain geographic location. Thus they would be 'sitting ducks' for the machinations of the big operators. They could be subordinated by a perpetual economic squeeze — through credit and perennial debt if nothing else. These small farmers would be the 'vegetable gardens' that supplied the basic take of the chiseling rackets.

It must be obvious to all that the ideal situation for one group of people is not likely to be ideal for all others. What is ideal for the wolf may be far from ideal for the sheep.

The 'ideal' pattern of 'forty acres and a mule' has gone out of vogue in most places on this Continent — being still retained in only the most 'primitive' areas. Its going was not the desire of either the chiseler or the sucker — both of them wanted it retained. It was outmoded by technology, the application of power tools to agriculture.

A similar situation has long prevailed, and still prevails, in many parts of West Europe, France for example. In France, the peasant farms have become subdivided into subsistence plots and are occupied by the maximum number of people. The peasants of France represent a high percentage of the population, nearly forty per cent, some four times the percentage of the farm population in the United States. They constitute a conservative, ignorant, superstitious, hard-working faction of the population. They are petty in their social relations and static in their mode of operations.

They are favored by the conservative politicians, the businessmen, and the clergy. They constitute a powerful political bloc. They can be counted on to be stubborn defenders of the status quo and to counteract the radical tendencies of the industrial workers and to offset the 'wickedness' of Paris. To social students and apologists, afflicted with static and indolent concepts, the peasants constitute the 'real France' and in them reside the true Christian virtues . . . But the technological revolution will overwhelm the peasant of France, as it is overwhelming all other peasant cultures. An entirely new kind of ideal will have to be formulated.

The stability of almost all past societies has been founded on a broad base of toiling, subordinate, low-cost, agricultural workers — serfs, slaves, peasants, monks, seasonal employees. They were not efficient societies, but they provided the soil and manure which nourished the orchids of politics, business, and priestcraft; and they provided much of the manpower for military adventures. Socially, the agricultural workers were closely akin to domestic servants and a little inferior to craftsmen and small traders. They suffered the most from military invasion and conquest. It is difficult, in the present context of events, to conceive of such a setup as being ideal. We dwell on it here only because for untold centuries, it constituted the way of life for the majority in all of the more advanced societies. It remained unaltered and unchallenged by other alternatives.

The people subsisted in their lowly agricultural status, not because they were happy in it, but, because it was the way of life that circumstances forced upon them. If they were unhappy with their lot, they did not have too long to worry about it; for, not many of them survived beyond early maturity.

An alternative to the individual, peasant-type pattern of agriculture has been the large plantation or estate. In most parts of the world (some more than others) there has been a tendency for some of the more wealthy citizens and institutions to acquire huge tracts of land

and have these operated by droves of low-paid, or non-paid, human workers. This pattern also extends far back in history. In such associations, the workers were kept at a minimal level of culture and subsistence while the estate owners and their families reveled in luxury and culture. Often the workers were maintained as part of the estate, hence were provided with year-around keep. Other times, they were merely recruited and hired as needed, having to fend for themselves during the slack periods. In any event, the 'labor costs' were grudgingly accepted by the estate owners, and these owners tended to extract the maximum feasible amount of effort from such labor. This is the present pattern throughout Latin America, in parts of Western Europe, and in most colonial territories around the world. In only a slightly modified form, it prevails in most of the world's monasteries. There are still remnants of it in the United States, where droves of low-paid imported laborers are employed as seasonally required. It prevailed in one of its most vicious forms in the sugar plantations of Cuba prior to the Castro revolution — to mention only one instance. (Evidently, that is the 'ideal' which the United States government and the Roman Catholic hierarchy want to see 'restored' in Cuba.)

The lot of the plantation workers is so miserable that the ideal way of life which they envision for themselves and which they aspire to is the small individual farm. This 'ideal' has become so strong among them that most practical programs of land reform must institute it as a temporary phase of the transition to a more efficient type of operation. Such was the case in postwar Poland and post-Chiang Kai-shek China.

The plantation pattern of agricultural operations is highly favored by all fascist-type societies, being even more ideal in the eyes of the fascist hierarchy than the peasant-type agricultural pattern. For one thing, it is a more efficient means of 'organizing' the take. It is especially adaptable to one-crop economies. The chief disadvantage of it, from the standpoint of the owners and operators, is

that it brings a large group of workers together in close association and gives them a common cause to brood over. That sometimes leads to trouble which, traditionally, is met with the utmost in cruelty and repression.

In recent years, an ancient ideology of collective security and welfare, has been revived and is gaining momentum. It is an ideal which appeals to many of the world's people, particularly those who have nothing to lose. This is competitive with, and a threat to, the fascist-type patterns of life. It is an ideal which the upper class of the West is out to destroy at all cost — by bullets, daggers, sabotage, boycott, bribery, blockade, threats, and even by the most destructive forms of nuclear age warfare. Regardless of the form of collective cooperation for purposes of welfare and security, it is derisively called 'communism' by the disciples of Freedom.

The world of mankind, at present, is dividing up for a showdown between Freedom and Communism, the world's two major ideals. An open outbreak of conflict between the two camps has not developed as yet on a large scale, mainly because not enough people view such a conflict as being necessary and worthwhile. Large blocs of nations refuse to view the differences in ideals as of such importance as to justify a world holocaust. They merely view the two ideals as interesting alternatives, to be proven by accomplishments in the field rather than by debate between polemicists or by clash of arms. Then, millions of people in the respective nations of communist and non-communist influence are more interested in keeping alive and finding a modus vivendi than in sacrificing themselves in a thermonuclear war. Militarily, the conflict is stalemated, except for local, small-scale skirmishes. But it is far from being reconciled.

Economically, the world of 'communism' is more efficient and potent than the world of individual enterprise — as coordinated group action must always be. The advantages of private enterprise 'incentives'

over group enterprise 'regimentation' is not evident on the surface to an impartial observer. A comparison of modern China with pre-war China, for example, would seem to argue in favor of collectivism. Even in America, the citadel of Free Enterprise, the advantages of collectivism (in certain crude forms) are being recognized; such as social security, insurance, military formations, and such public endeavors as the postal service, public schools, highways, national forests and national parks. Socially, collectivism attempts to eradicate the extreme poverty so prevalent in fascist and other Free countries.

The United States is the front nation on the side of Freedom. It has created more debt than any other nation in the world; hence, it serves as the banker for the cause of Freedom. Not being able to present the impoverished peoples of the world with a more attractive ideology than communism, America is seeking to bribe them with economic handouts. This is to be paid out of borrowings and taxes. However, the payoff system is very inefficient and very corrupt; so, very little of it ever reaches the people who are most in need of being dissuaded from seeking economic betterment under communism. The American 'system' of bribery is bearing bitter fruit in such places as Latin America, southeast Asia, the Middle East, Africa, and certain parts of Western Europe. Our Foreign Aid (so-called) does not do much to win and influence the populace when the ones that are most in need of being won over and influenced have to walk along the roadsides in bare feet and tattered clothes while the wealthy aristocrats ride by in air-conditioned Cadillacs paid for by the Foreign Aid that was supposed to 'fight communism.' Such a program of anti-communism could not be more negative in its results if it were designed for us in the Kremlin.

The leaders of Communism do not have to oppose us in open combat. All they have to do is stand by, operate on the cheap, then pick up the pieces from Freedom's blunders. Billions of dollars worth of supplies and services provided the overlords of Chiang Kai-shek's

regime did not save China from Communism; rather it facilitated its take-over. Similar payoffs have not succeeded in Latin America or Africa nor as yet in many other places where they have been applied. Political economists in America are screaming (whether out of sincerity or for purposes of personal publicity is not clear) for more efficient administration of Foreign Aid. But an efficient program of Foreign Aid would be so far out of character for the disciples of Freedom and so contrary to all past history of such, as well as being so much at variance with Western ideology, that it would be the surprise of the century if it did happen.

Ever since the days of savagery, the great emphasis on human welfare has been at the family level rather than at the group level. The primitive savages operated as a group, sharing supplies mutually among all members of the group. But only rarely has such a pattern prevailed since then, although it often has been held as an ideal among small groups, usually of religious or semi-religious character. On the whole, since ancient times, economic welfare has been primarily a family concern.

Primitive peoples thought of economic security in terms of goods — food, clothing, shelters, tools of their trade — and their idea of heaven was a place where these would always be available when needed. Even the American pioneers tallied their blessings in terms of available supplies—food stored away for future use; animals available for meat, milk, and leather; textiles for making clothing; and supplies, such as logs, available for buildings. They had little occasion to think of money as such, except as it was needed to buy the few things which they could not produce themselves.

But times have changed and, now, everything is evaluated in terms of price. Money comes first, all else follows.

The concept that everything can be bought with money is so prevalent that it seems only natural for Americans to place a price on Salvation. This, they attempt to buy through contri-

butions to their respective churches. Needless to say, the church hierarchies are most enthusiastic about, and most cooperative with, this idea; in fact, they often provide the going price for their clients in the form of assessments. After listening to appeals for funds by church spokesmen over the radio, one almost gets the feeling that Heaven is operated on a monetary standard and that it would have to close up shop if the inflow of American dollars should dry up. The exact amount of contributions that is required to guarantee Salvation is a real concern to many American families each year. Many who have led dubious lives in terms of their spiritual ideals seek to buy atonement with last minute contributions of generous size, perhaps much to the dismay of their heirs who are not yet ready for such drastic measures.

North Americans are at loose ends when it comes to contemplating the ideals of life and living. The old aspirations are dying out or no longer apply. For many centuries, the brightest dream of personal glory for the 'common people' was somehow attaining status as a member of the upper class. This was the theme of many popular stories, particularly those designed for children. Since almost no practical course was open for a commoner to attain noble status, its realization had to be envisioned as being brought about by some magic transformation — as a gratuity or reward bestowed by supernatural beings. But now, particularly in America, the attainment of high social status is merely a matter of acquiring enough money; and there is an outside chance that this could happen to anyone—for example, to one who can raise enough money to buy a ticket in the Irish Sweepstakes.

The ideal of an American in the middle income group hovers rather close to the general pattern of owning an estate near a large city, with a swimming pool, two cars, a motorboat, a college education for the children, and a managerial job in some prospering corporation. The details may vary in kind and extravagance with the rela-

tive economic situation of the individual, but the essential ingredient in most ideals is an income of above average size. Hollywood and Madison Avenue have contributed substantially to this form of ideal by continuously glorifying the way of life of the wealthy and near-wealthy. World War II and the postwar prosperity boom, founded on debt, brought this ideal close enough to potential realization that numerous Americans decided to make a try for it.

Perpetual prosperity became the American dream. For a while after the war, the farmers got high prices for what they produced. Skilled and semi-skilled workers got easy, good-paying jobs with plenty of lush overtime. Engineers, salesmen, executives, and promoters found their services in demand at inflated salaries. Landlords and professional people made a 'killing.' The American public never had it so good. The Promised Land had been reached, and the multitudes settled into a conservative rut, satisfied in general with things as they were. The ideal of Permanent Prosperity was readily and enthusiastically accepted by the great majority of Americans; and, insofar as they were individually concerned, this ideal was enough to sustain them from here on out.

But soon the prosperity boom began to turn sour. For one thing, it was inevitable that the smart operators would get greedy and start gobbling up the small fry, first, then turn to gobbling up the bigger fish. The rat race became steadily more vicious. But human cussedness was not the only sand in the gears of Prosperity.

The most decisive and stubborn factor was technological in nature. Technology drastically changed the way of doing work, and this change was concentrated on getting ever higher production with ever declining man-hours of labor.

Technology has forced the human being to revise his concepts completely and to alter his ideals accordingly. Technology has all but wiped out the pattern of small farm economy. Technology is destroying the concept of earning an income from

working at a steady job. Technology is also eliminating the fear of want and undermining the pioneer virtue of frugality. Technology is making scarcity obsolete for the people of this Continent and is forcing them to consider, for the first time in the world, an economy of abundance. But this change is far from smooth and devoid of conflict and hardship. The ideals of the Old Order still dominate the minds of our leaders.

In the technological change-over to abundance, the one thing that is most sacred to American life will have to be aban-doned — money. Money has a function only in an economy of scarcity. For many decades, sporadic individuals have envisioned a moneyless society. But it was left to Technocracy to come up with a practical design for bringing it to realization. Strangely enough, Technocracy does not present its design in the form of an ideal. It is presented as a workable means of distributing abundance. Technocracy presumes that abundance will soon be here and, in preparing the way for it, does not treat it as an Ideal to be achieved because it is Good. Rather, abundance is regarded as a technological problem. Technocrats concern themselves with the next most probable social state on the North American Continent and with a functional program for its operation.

Technocracy is not asking North Americans to abandon money and prepare for life in the Technate as a matter of desire and volition on their part. We are sure that if you had your choice you would stick with the money system. It has become a deep-rooted part of your personality, and it fascinates you. Instead, we point out that the age-old Price System is crumbling away and that you are being forced by factors beyond your control to experience a fundamental change in your way of life and in your concepts of economic problems. But we are satisfied that, once you have become accustomed to the idea of abundance, you will have a feeling of security and adjustment that will enable you to transcend the worries of the Price System and to seek ideals

far removed from money matters.

To you North Americans who are becoming disillusioned with the economic ideals of the past and nauseated with the present stench of commercialism on this Continent, may we suggest that you study Technocracy's program of abundance for all? Technocracy's program is devoid of the commercialism, the malpractices, and the uncertainties of a money economy. Study it and see for yourselves if it does not contain the elements of an Ideal worthy to inspire the enthusiasms of mankind.

If you feel that we have missed the boat in our discussion of ideals by concentrating our attention on economic aspects of life, please be reminded that once the factor of economic security is removed as a problem from the lives of individual North Americans, once abundance can be taken for granted as a function of life on this Continent, then, they can turn their attention to other kinds of ideals — away from the chicaneries of making a living to the art of making a life.

—Wilton Ivie

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* OTTAWA—The federal government's atomic agency is building an experimental machine to irradiate potatoes to prevent sprouting during storage. R. F. Errington, manager of the commercial products division of Atomic Enegy of Canada Limited, told the Commons research committee that he hopes the machine will be completed by fall in time for tests with the new potato crop. Most of the tests will be conducted in New Brunswick.

Mr. Errington said his company is working in close conjunction with potato producers in the development of the machine. The objective was to find an economic method to put to use a scientifically proved irradiation process that stops sprouting and wilting during winter storage. The process involves the irradiation of potatoes with a low-power gamma ray which passes through the potato like sunlight through a window and kills the sprouts before they start to grow. The rays do not leave any atomic materials that would make the potato radioactive. Gamma rays had no mass and were unable to make anything radioactive, said Mr. Errington.

He said that if the process can be developed to the point where it can be used without causing any undue rise in potato prices, it will mean that potatoes can be stored for long periods of time. The process does not change the taste of the potato or reduce its food value. The test machine will irradiate sample quantities of potatoes in the foll. They would then be stored during the winter and tested next year to determine the effectiveness and cost of using the process on a commercial scale. —CANADIAN PRESS

Follow The Leader

Most people tend to follow the leadership of anyone who argues convincingly about politics and other matters. Now their survival demands that they follow those whose technical training has made them preeminent leaders.

SUMMER has brought forth its usual array of gaily colored clothing for informal wear. During their relaxed hours men wear sensible lightweight slacks and short-sleeved, open-neck shirts without feeling in the least conspicuous. While at work, however, the same men — especially those of the white-collar office brigade — shun such attire rather than face the feared disapproval that might accompany the discarding of ties and suit jackets. They struggle through 70 to 100 degree temperatures uncomfortably while cursing their restrictive apparel for hampering their functional efficiency.

Women may wear more appropriate summer attire than men, but this certainly does not apply at the present time to their footgear. Since an Italian fashion designer decreed a couple of years ago that pointed shoes were the acme of style, millions of women in their frenzy to conform have suffered crippling misery to the subsidization and delight of the chiropodists' fraternity.

These are but two of the extremes to which people will go to be like each other! It is rather ironic, especially in reference to North Americans who have made such a fetish of 'freedom' and 'individuality.' True, they do differ as to intelligence, degrees of health and vigor, aptitudes and opportunities, but socially they tend to be quite similar. As a survival measure they have found it necessary to depend on each other for their physical needs, and hence have had to conform to certain behavioural patterns which have been established. They have become so conditioned to conforming to required patterns that they have done so

also to others that are not only unnecessary but often absurd and detrimental.

If people will conform to established patterns, they will also change to others under sufficient stimulus. Hence, should a person of sartorial prominence commence wearing open-neck shirts and leaving off his suit jacket at more formal events, it is a safe bet that most other white collar workers would soon follow his lead. Similarly, should properly designed shoes displace the present pointed monstrosities in fashionable circles, the distaff population would undoubtedly hasten to the new banner. After all, irrespective of any therapeutic advantages to be gained, who wants to be considered old fashioned simply for cleaving to earlier styles?

Most people are followers. Greater or lesser segments of them can be induced to follow anyone who presents convincing arguments for pet ideas in religion, politics, economics and many other fields. It matters little what is being espoused as long as potential adherents are not asked to 'go it alone' in their support. They want to be assured that they have company, and preferably that of well-known, respected people. With this assurance they will conform to any pattern that is established for them, whether it be relatively constant or frequently changeable.

The tendency to conform is a major factor in maintaining law and order. Were this not so, the police would be totally incapable of enforcing the laws intended to regulate human behaviour. Bedlam would ensue in short order, for instance, if all motorists ignored all traffic control regulations. It is bad enough as it is in and around metropolitan centers, but it would be hopeless if there were no conformity with driving codes. Part of the existing conformity results from the desire to avoid court penalties and collision costs, but even without these modifying influences most drivers would normally conform to the traffic laws.

The mounting violations of traffic and other laws may seem to constitute departures from conformity tendencies, but such

is not the case. They represent instead a different pattern that is opposed to the socially acceptable, but which is no less valid. Adherents of anti-social behavioural patterns are just as strongly conformist as are the more law abiding elements of the population.

In other social fields not involving the law there are numerous obligations imposed on people to which they must conform to be acceptable within their respective environments. Here again they are following the lead set by pacesetters whose leadership has some acknowledgment. Prominent in this category are the status-happy residents of Georgetown, District of Columbia. In this high-income-bracket residential suburb of Washington are imposed very rigid restrictions on the type of building that can be built. All must assume the same starkly colonial or federal architecture. There can be no modern-style adornments or lighting fixtures in external evidence. One lady who installed a large picture window to provide more light to her hall was obliged to remove it at considerable expense and replace it with one of more austere but approved motif. Those who would live in Georgetown *must* conform to its edicts or seek residence elsewhere!

Other suburbias may not be as stringently demanding as Georgetown, but they do have financial and social obligations which must be met as a condition of acceptance. Far from objecting to such requirements, would-be residents practically climb over each other in their eagerness to conform. The tougher the requirements, the greater the measure of social prestige to be gained from fulfilling them. In this respect it is frequently held as a serious breach of etiquette if an employee of a firm buys a more expensive house, car or other accouterment than that possessed by his employer or immediate superior. On the other hand, if such employee receives a promotion with a substantial increase in income, he is expected to move into a higher bracket residential district that will reflect his improved circumstances. Further, he must move

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OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

August, 1961 *Compiled by Editorial Staff* No. 181

Automated Paperwork

A ROCKET - LIKE container loaded with IBM cards, flying through an automatic, electronically controlled system of pipelines in your offices might sound pretty futuristic.

But it is not. In fact such basic systems have been in use for more than 80 years in Canada and the U.S., and are still working today.

In some department stores and offices built at the turn of the century you can still see the polished brass tubes and ornate, cast-bronze stations of early airtube systems.

These are not automatic but apply the same principle of vacuum which draws the cylindrical paperwork carriers through a tube.

About 1,000 airtube systems of varying age are in use in Canada, many of them fully automatic. They handle a great variety of paperwork, punchcards, blue prints, small parts and cash in every type of office, store or plant.

With production automation developed to such a degree and consequent transfer of labor-costs into administrative operations, methods

engineers are turning their attention to the automation of paperwork delivery systems.

In an independent survey of 271 manufacturing and business establishments with a total office employment of 40,386 persons, it was found that most of the work done consisted of simply moving papers of various sizes and colors from one desk to another, and with the filing cabinet as the ultimate destination.

The actual processing of the paper was only a small part of the work.

Further facts of the note:

- 66% of these employees were women with an average monthly 'separation rate' of 3.5%.

In other words, because of job-jumping, marriage, pregnancy, or other reasons, 11,214 of the above total left their jobs in one year.

- It was also calculated that it costs a large organization about $350 to put one new clerk on the payroll (interviews, tests, medicals, training, paperwork).

During the last century, industrial productivity has increased 1,400% while office efficiency has increased only 45%.

One reason for this: While $14,000 worth of time-saving mechanization has been provided per production worker, only about $1,000 has been spent to assist the average office worker.

The slow paper flow problem cuts across the entire industrial-business spectrum.

From the president down to the shipper, everyone is kept waiting for paper. These holdups have tremendous direct costs but there are also a very wide variety of indirect costs.

For instance, one large company with a multi-story office building discovered that messengers were tying up passenger elevators to such an extent that hundreds of man hours per day were wasted in waiting time, much of it by top executives.

To get some idea of the snail's pace at which hand carried paperwork moves, imagine a telephone system which takes 15 minutes for

your voice to reach the department five floors below and then a further 15 minutes for the answer to return.

And in these days of large organization systems almost every detail of business transacted must be committed to paper.

With computers, it takes only fractions of a second to process the most complicated data and commit it to paper. Yet it often takes hours for that piece of paper to travel a few hundred feet.

The president waits, the shipper waits, and worst of all, the customer waits.

A variety of highly developed paperwork handling systems are now available and are already in operation in many up-to-date organizations. These include automatic pneumatic conveyors, automatic selective vertical conveyors, horizontal belt conveyors, and combinations of all three.

The ideal manufacturing plant layout is a single horizontal plane and may cover several acres. In contrast, the modern office building, by reason of high land values, is invariably a vertical plane, or rather, a series of small horizontal planes arranged vertically.

In both cases, paperwork may actually travel miles in a complex pattern of interconnected loops, shuttles, which follow no regular routes.

The airtube conveyor is best suited for requirements of high-speed transmission of individual small quantities of paperwork between many different points.

Airtubes work either horizontally or vertically, traveling up to 40 ft. per second, up to almost any height and distances of more than a quarter of a mile.

Standard airtube carriers range from 1 1/4 in. diameter up to a 3 in. x 12 in. rectangular type 18 in. in length.

In automatic airtube systems, the carrier is directed to different stations by various methods of control.

These include pushbutton selection, remote telephone-type dialing selection or a system of selective carriers which have individual built-in dial-system and contact code. This latter type is the most desirable for large complex systems since the selective carrier controls itself, guided

to its destination by the pre-set code and does not require inter-station wiring.

Each station has a code switch which is tripped when the identical code is dialed on the carrier.

A typical case history of an automatic airtube system in an electrical industry complex reveals that 95% of all communications material is now handled by the system.

This material flows between 80 different departments with 36 automatic stations scattered throughout a 1,520,000 sq. ft. two-story plant.

The system is capable of handling up to 1,200 carriers per hour and the traveling time between farthest points in 90 seconds. In this system six loops interconnect at a single automatic monitor which routes the self-directed selective carriers without inter-station wiring of any kind.

It has been calculated that the capital investment of this system will be amortized in 2.7 years.

Single station-to-station manual airtubes systems may cost as little as $525, while large automatic systems cost up to $250,000. Average amortization based on direct savings is less than 3 years.

Major users in Canada include insurance companies, oil companies, banks, manufacturing industries, hotels, hospitals, stores, railways, airlines, steel mills, mines, breweries, telephone companies, utilities, governments, parts warehouses and even ocean-going vessels.

Many automatic airtube systems are presently being engineered into new buildings under construction but many more are installed in existing buildings with the minimum of disturbance.

The pneumatic tubes may be installed outdoors, underground, or overhead between different buildings. Single runs of more than a quarter of a mile are common and with booster air units may be extended almost without limit.

Systems are easily added to or modified and independent systems may be linked when required. The systems will work night and day without attention and with minimum maintenance.

In many automatic systems, the amount of air exhausted is

automatically varied according to the demand, so that in slack periods there is a minimum wastage of power.

A point is sometimes reached in paperwork handling beyond which a pneumatic conveyor is inapplicable. This may be because of the large volume of paper handled or the size or weight of individual pieces.

This situation often arises in large multi-story office buildings generally occupied by one company. The Imperial Oil building, Toronto, is an example. Here a selective vertical conveyor system is used.

This system is basically an electronically controlled endless chain lift. Boxes of paperwork, parcels, are placed on a platform aligned with a hatchway at the loading station, a dial is set, the constantly moving conveyor automatically collects the box and subsequently ejects it at the pre-selected floor.

With an installation of this type, a million pieces of mail per month are handled.

Where paper flow is also heavy in a horizontal plane as well as the vertical, a series of automatically controlled horizontal belt conveyors may be integrated with selective vertical conveyors.

In addition, high speed paperwork transmissions in small units may still be provided by automatic airtube systems. Several Canadian companies have multiple systems of this type.

The 'Paperwork Explosion' is a very serious threat to the competitive position of Canadian businesses in world markets.

Last year, Canadian business employment of clerks increased by about 20,000 without any comparable increase in sales.

Saving money is the same as making money, as any company treasurer knows.

With an average net margin of 5%, it takes an extra $100,000 in sales to equal $5,000 saved.

And several companies are now saving as much as $70,000 a year with automated paperwork systems.

—By J. L. Fell in The Financial Post

Latest In Plastics

NEW YORK — A great variety of new products made of various plastics went on display at the National Plastics Exposition at the New York Colliseum in June.

A review of what is in store for American consumers and industrialists indicates the rapid rise of plastics in housewares, apparel, furnishings and many other uses in hard-wearing, light-weight, color-fast designs.

Especially important industrially, the all-plastic shipping container, a lighter version of the metal drum, that can hold up to fifty-five gallons. These containers, produced by the blow-moulding technique, are for use where chemical and corrosion resistance is essential and where savings in weight are important.

Blow molding, a modern version of the ancient art of glass blowing, is the fastest growing part of the plastics industry. E. E. Winnie, vice-president of the polymer chemicals division of W. R. Grace & Co., said that it was possible that such drums could take over a substantial part of the field now being served by glass carboys, steel drums and pails. The Grace division is a leading supplier of the high-density polyethylene from which the containers are made.

'As prices of metals and other materials continue to increase and plastic resin prices remain the same or possibly decrease, there will be a continuing increase in the areas where it is economically advantageous to use industrial containers of high density polyethylene,' Mr. Winne said.

During the last year blow-molded industrial containers of high-density polyethylene consumed close to 1,000,000 pounds. New compounds of high-density polyethylene and the development of suitable fabricating equipment indicate a possible market of 40,000,000 pounds for container use by 1965.

The exposition and a concurrent conference was sponsored by the Society of the Plastics Industry, Inc. The event was held in this city for the first time since 1956.

There were more than 260 concerns in every phase of the plastics industry showing the latest materials, fabrication methods and applications. There also were sessions at the Commodore Hotel on some of the more important areas of plastics use, among them building, communications, machinery, packaging, automobiles and defense.

One of the more striking exhibits to be seen was a sleek 35-foot ocean racing sloop, shown by the Celanese Corporation of America. The vessel which sells for $17,985, was built by Pearson Corporation of Bristol, R.I., from a design by Carl A. Alberg. It has a single-unit hull molded of glass-reinforced Celanese polyester resins.

In addition to polyesters, Celanese Polymer Company and Celanese Plastics Company showed a variety of resins and end products including Celcon, a new high-strength acetal co-polymer; Fortiflex, a high-density polyethylene; cellulose acetate, cellulose propionate and a line of Celanese packaging materials, including acetate film and sheeting, polyethylene film and blown bottles and containers.

The products on display indicate the versatility and wide range of applications served by Celanese polymers and plastics. Celanese is stressing its Celcon, which is counted on to challenge metals and other plastics for applications in automobiles, appliances, containers, pipe, hardware and industrial equipment.

Celcon items include automotive dash panels, door handles, dome lights, gear housings, wire covering, pipe and aerosol containers. Tests staged continuously to show what the product can do.

B. F. Goodrich Chemical Company showed nearly 100 products made from plastics in its 'Plastics for Living' exhibit. Among the applications made possible by Geon vinyl plastics, high-temperature Geon vinyl compounds, Abson thermoplastic resins and compounds and Estane polyurethane materials, are a colorful scuff-resistant flooring, vinyl-coated aluminum siding, a self-priming vinyl latex exterior paint and a rigid vinyl striped window awning.

The window frame also is of vinyl, as is the window box and a garden, which contains molded artificial vinyl foliage. So, too, are a gas pipe, an electric feeder cable, parts in an electric meter, roof flashing, the sprinkler systm, the drapes, and even the kitchen sink.

Harry B. Warner, president of Goodrich Chemical, predicted that the market for plastic building materials would rise from the present $450,000,000 to $4,500,000,000 by 1970. He estimated that plastics would account for about 20 per cent of the materials being used in home construction by the end of the decade.

Montecatini, Italian producer, showed the latest developments in polypropylene film, fiber and resin. It showed a number of finished articles. Taking part in the exhibit were Novamont Corporation, Montecatini's wholly owned American manufacturing subsidiary, and Chemore Corporation, general representative in this country and Canada for Montecatini and Novamont.

The Monsanto Chemical Company showed plastics that can stand up to blows of a sledge hammer, chisel-sharp spike shoe heels and a falling bowling ball. —*New York Times*

Space Job For Sand

ATLANTA, Ga.—A Georgian's insistence that the textbooks were wrong has led to a space-era role for an age-old material — common sand.

The result is a product credited with being a key to the building of the 2,000-miles-an-hour B-70 bomber, and a possible way to cutting costs in several industries .

The sand is changed into a material called Glasrock in a patented process developed by John W. North, a 54-year-old native of Newnan, Ga.

He predicts it may revolutionize the tedious and costly process used to make molds that form items ranging from automobile crankshafts and frying pans to plumbing fixtures and costume jewelry.

With the help of the ceramics branch of the Georgia Institute of Technology, his alma mater, Mr. North found an economical way to melt silica sand, and then grind it into grain or powder at room temperatures.

Fused silica, an old material, had not had widespread use before

because of complexities of forming and expenses of production.

THE TEXTBOOK THEORY

'And the textbooks said,' Mr. North recalled, 'that fused silica would recrystallize at about 2,000 degrees Fahrenheit. In looking for a substance that was readily available, inexpensive and could perform well when molten metal touched it at 2,500 to 3,000 degrees, I felt silica sand was the answer.'

After a series of experiments he was proved right, and the result was Glasrock, which has almost no expansion when heated, low heat conductivity and excellent resistance to sudden temperature changes.

Mr. North, a graduate engineer who had built a large industrial insulation contracting business, raised $250,000 to start Glasrock Products, Inc., in 1959. 'Our first goal,' he said, 'was one big success, to get a quantity of materials going through the shop, put money in the bank, and dramatize the product.'

He sought that success in the tooling of the B-70's skin, which is a sandwich of a steel honeycomb brazed between two sheets of stainless steel.

When stainless steel is used in a supersonic aircraft, the panels must be formed to exact dimensions or there would be terrific friction at high speeds, causing extreme heat. But in heating the steel sandwich for the brazing process, the metal becomes as limp as wet tissue paper.

GLASROCK'S JOB

Glasrock's job was to form the steel, and at the same time not give in to the heat. The process worked, and the B-70 project seemed to be giving Mr. North the push he needed. Then—in late 1959—the plane program was cut back sharply, putting Glasrock Products in a precarious financial position.

A stockholder stepped in with big money, suppliers liberalized credit and the company survived despite the further blow of a plant fire. The B-70 project was kept alive, and by last September new orders were coming in for Glasrock for the tooling program.

Now, Mr. North says, his company is working with foundries on techniques of forming by pouring iron in Glasrock molds. He added:

'Foundry molds, now generally made from sand and a bonding agent, can be used for only one casting before re-forming. In experiments more than 100 castings have been made from a single Glasrock mold without signs of deterioration.'

Mr. North's product also is used in place of fire brick for the lining of the combustion chamber in steam generators used by Diesel railroad locomotives to produce heat and hot water for passenger trains.

Glasrock, which has the appearance of unpainted plaster when the process is completed, starts with sand containing at least 99 per cent silica.

3,800-DEGREE ARC FURNACE

Using a 3,800-degree electric arc furnace, the sand is fused into huge chunks. It is crushed into small pieces and pulverized until it varies from the fineness of facial powder to table salt, depending on the texture desired.

It then is put in plaster casts — with a foaming agent added if easy shaping is wanted at a later time — and set, dried and fired in a kiln. —*Associated Press*

Charcoal From Sawdust

THE CURRENT activities at the British Columbia Research Council reflect to a considerable degree, industry demand for research services. A considerable part of Council's work involves short-term studies.

In the product development field, for example, the demand is more for the improvement of existing products than for long-term research aimed at completely new products.

There is also a growing demand for product evaluation work, primarily a specialized testing function to supplement the services of commercial testing laboratories. Finally, there is a considerable amount of product and process work for industry that is best classified as industrial trouble-shooting.

Some brief notes on certain of the larger projects and project

areas will help to demonstrate the diversity of the Research Council's activities.

In the past year this laboratory has been actively engaged in the pilot-plant stage of the development of a fluidized-bed process for the production of charcoal from sawdust and other small particle size wood waste.

The product is a high quality charcoal intended for a specialty market. The present contract work developed out of an earlier study by the Council aimed primarily at the production of wood gas from wood waste.

In the original work, charcoal was a by-product of gas production.

The basic process, patented by the Council, can be controlled so as to vary the product mix through a wide range.

Our specialized knowledge and extensive experience with odour control in sulphate paper mills is recognized by industry.

Work with local companies has placed emphasis on methods of monitoring plant operations for maximum efficiency and for suppressing undesired odour emissions.

Laboratory studies have led to patent applications covering improved control measures. Two contracts are presently in hand for the design of black liquor oxidation towers; one is for a new kraft mill in Quebec, the other for a mill in Sweden. Design of the latter's new mill is being undertaken by the Vancouver consulting firm of H. A. Simons.

A new use for 'fish solubles,' a product of the fishing industry, has been developed in the laboratory.

The fish solubles, mixed with grass seed, are sprayed on road cuts to stabilize the soil and promote seed growth. Field trials carried out in co-operation with the B.C. Department of Highways gave a superior growth of grass during an extremely dry period.

One B.C. manufacturer of rope products has contracted with the council for a continuing program of product and process improvement.

While the primary emphasis to date has been on chemical problems, other areas for possible improvement are being considered.

Anticipating a demand for improved materials for factory patching of certain defects in plywood panels, the council has developed a

radically new filler material which is currently undergoing assessment.

In addition to requirements of color, machinability, and ease of use, the material has to withstand the standard boiling-water test for exterior plywood.

Infra-red spectroscopy has been widely used by council chemists over the past few years.

Two years ago, the need developed for measurements in the far infra-red, beyond the range of existing instruments, and we undertook to develop an instrument to meet these needs.

A unit has now been built and operated successfully, thanks to a continuing research grant from Trans-Mountain Oil Pipe Line Co.

Applied research depends on fundamental research, so any program in an industrial research organization should include basic studies in various areas.

For several years now, the council has been engaged in a study of anodic oxide films.

In addition to making regular contributions to fundamental knowledge in this field, this group has, in the past year, developed a new, more compact type of metallized capacitor for use in electronic circuits.

In the continual war against corrosion, this laboratory is making a substantial contribution each year. Projects have involved pipeline, large process equipment and steel piling installations as well as a number of less important undertakings.

Some projects involve laboratory studies, some field studies, but all demand an extensive knowledge of the corrosion field combined with a sound knowledge of chemistry and the other basic sciences.

—G. M. Shrum in Financial Post

(Dr. Shrum is Director of the British Columbia Research Council)

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* ITHACA, N.Y.—A radar-radio telescope with the largest antenna in the world, now under construction at Arecibo, Puerto Rico, will be ready for use by next February, say Cornell University scientists. The $6.5 millions Department of Defense ionospheric research facility will make possible a study of the upper atmosphere, the composition of space and the solar system by radar.

Prof. William E. Gordon, project officer for Cornell, is responsible for the general conception of the observatory project, the selection of the site and development of standards. The reflector, 1,000 feet in diameter, is stationary and is being placed in a natural bowl.

—UNITED PRESS INTERNATIONAL

(From page 20)

in approved social circles, join the right clubs, and otherwise deport himself in a manner established as befitting his position. Failure to conform seriously jeopardizes his chances for further promotions.

The same tendency to conform to patterns set by more enterprising citizens permeates the entire social fabric. If a person joins an organization he must agree to abide by its constitution and bylaws as a condition of membership. If he operates a business he must observe the rules of Price System operation by reducing his expenses as effectively as possible in order to realize a maximum return on sales. Should his revenues not keep ahead of expenses, then he must ultimately go out of business. Sentimentality for the welfare of employees must not influence his decisions on courses of action to follow to stay in business. The rules of the game of the Price System must take precedence over all else.

As yet we have surveyed only the more superficial aspects of the human tendency to follow leaders and to conform to behavioural patterns that these leaders establish. Pertinent as they may be, they only serve to demonstrate the existence of the tendency without underlining its importance. For better or worse, it must be accepted for what it is as a major behavioural manifestation which shows no signs of disappearing. Such being the case, it must be seriously considered in any objective study of social problems.

Fortunately — or unfortunately as has frequently been the case — the conformity tendency *can* be channelized. This has been achieved quite effectively within the Price System through commercial advertising and political campaigning which have thus far sustained enough public support in the creaking economy to keep it going. For the most part the artifices employed have also been of superficial character, but when its position has been most precarious, the Price System has resorted to more desperate measures which better indicate the social significance of the tendency to conform to patterns established by financial or politi-

cal leaders. One such artifice is that of war.

We are not concerned now with the reasons that drive nations to war, but with the factors that make it an outstanding example of how people conform for conformity's sake without understanding the issues involved. Suffice it to say as far as the reasons for war are concerned that when an economy such as that of North America's is dependent for survival upon large-scale armament programs, it is almost inevitable that eventually an incident will be evoked that will lead to war.

Presume, then, that such an incident has occurred and the duly constituted government has declared war on another nation. All citizens on both sides are expected to answer the call to arms and support their respective nations in the execution of hostilities, and in most cases this is achieved adequately enough to conduct a military campaign of some duration. But what would happen if all citizens on both sides refused to take up arms and fight? Obviously it would be impossible for the governments of the would-be belligerent powers to conduct a war. Socially speaking, this is probably the best thing that could happen, but there is no record of its ever having occurred — at least not on any significant scale. Appeals to patriotism, descriptions of reasons for going to war as 'just causes,' and vilifying propaganda against the people and government of the other power are generally sufficient to induce the citizenry of each to participate in the conflict.

When the armed forces reach the battle fronts, it would again be impossible to pursue hostilities if the men of each side refused to fight. By the time they reach this stage, though, their training and propaganda conditioning constitutes almost certain proof against such refusal. Moreover, they are generally more afraid of what their fellow troops will think of them for not participating than they are of facing enemy fire. In other words, they conform with the behavioural pattern of the moment because they would rather die than be thought cowards. The fear of what may happen to them if taken prison-

er is an added inducement to do what is expected of them.

This rather grim example of leadership is amplified by the number of times the device of war has been used. In each case, often with very brief temporal separations, the general public have conformed to the pattern established by their financial and political leaders despite their still vivid memories, especially in the embattled areas, of the miseries, deprivations and horrors of previous wartime experiences.

Similarly, the citizens of North America have stubbornly maintained their support of their Price System economy which has shown signs of increasing instability ever since World War I. This is rather paradoxical, for in the same period of time they have accepted as a matter of course more social change in the form of physical accessories and ways of doing work than had ever before occurred. The strange part of the paradox is that the second aspect was brought about in support of the first. Basically, however, the two are irreconcilable — a fact which is accelerating this Continent toward a major social decision which must be made correctly as a paramount measure of survival.

Meanwhile, North Americans continue to follow the lead given them by the champions of the Price System. But how can competent leadership be given by such people when their only knowledge is of Price System operation and their only interest is in perpetuating it? They are as rigid conformists as those whom they presume to lead — conformists to the rules of the game of the Price System . . . Buy low, sell high, produce shoddy goods for quick turnover, waste, burn and destroy! These are some of the essential rules on which the continuance of the economy is based. To abide by them well enough to keep the economy operating is becoming increasingly more difficult, and is necessitating correspondingly more drastic measures. The frenzied search for new supports to prop under the sagging economy is reaching paranoiac proportions, but still the Continent's citizens continue to follow these 'leaders' lemming-like

along a course that can only end in extinction.

To avoid such disaster, North Americans must soon seek a new brand of leadership — one that is cognizant of the significance of what is happening on this land area as the result of the impact of abundance on an archaic, scarcity-born economy. Such leadership is inherent within the ranks of those who designed, constructed and are operating the equipment that has made that possible. As yet, however, too many of these people—scientists, technologists and engineers—are still too indoctrinated with Price System conditioning to realize their own social importance. They have assumed a backseat role in social affairs as the employees of Price System industry while having been responsible for putting that industry in a foremost world position in productive capacity. Soon they must assume the leadership role which only they are competent to fill, but first they must acquaint themselves with the nature of their responsibility. To make them so aware is one of the important tasks of Technocracy Incorporated which has alone analyzed physical trends as they have been occurring on this Continent, and has prepared and is presenting a blueprint of social operations specifically designed to meet the needs of the prevailing conditions of abundance. Being of scientific design it is of a nature that can be readily understood by the scientifically trained personnel already mentioned; and as it is the only social program which is adequate to the physical needs of abundance, it is urgent that these personnel give it their earliest attention.

Consideration of the Technocracy social program, which is a complete departure from any other should come relatively simply to such people for, whether or not they realize it, the very nature of their work has to some degree made them non-conformists. In most respects, they like everyone else are conformists to established patterns, but especially if they are doing basic research work they are reaching into the unknown where most people dare not go. They are in distinguished company. To people of their type society owes most of the

progress it has made, in spite of rather than because of existing political controls. They have been the trail blazers whom others have followed in developing new products and productive techniques, in combatting disease, and in other ways too numerous to mention. In less than two hundred years they have introduced more social change than has been effected by all the political legislators throughout the world in over seven thousand years of recorded history.

Scientists have been liberally sprinkled among the ranks of genuine non-conformists, not because they sought to be such but because their inquiring minds have directed their attention beyond the scope of the more conventionally inclined. Since their findings have frequently upset established dogma and beliefs, it is not surprising that they have encountered considerable opposition. Galileo, for instance, was forced to recant his support of Copernicus' theory (published just before the latter's death) that the sun rather than the earth is the center of our planetary system. Today, however, this proposition is universally held and supported by astronomical observation.

Eventually, the new ideas propounded by those using the scientific method have been accepted for the simple reason that they could not be refuted. Based on investigation and repeated experiment rather than on unsupported opinion, the conclusions of the scientists have been generally incontestable. This century has witnessed such rapid material advances that, in the field of physical phenomena at least, scientists have become reasonably accepted for the marvels they have produced. The same cannot be said in the social field where they are still regarded with considerable suspicion. Yet our world of today is so much of their making that they are indispensable — at least in North America. Some of the more socially conscious among them have recognized their responsibility. Since they can accomplish little by individual appeals to a socially deaf public, their efforts would be more productive if turned to an investigation of the

only organization which is preparing the people of this Continent for social change.

They have their work cut out for them, with their investigation of Technocracy being the simplest part. On their shoulders, because they more than anyone else understand the physical operations of North America, rests largely the responsibility of leading their fellow citizens along a new social course toward the abundance and security guaranteed in the design of the North American Technate. Technocracy has already pioneered the way by the work it has done in research; it is up to *all* responsible North Americans to see that the social blueprint is put into effect. Those familiar with the application of the scientific method must by virtue of their training be in the forefront.

North Americans must soon decide whom they will follow in the critical days ahead. If they are to survive, the moribund leadership of the Price System can hardly be considered as a choice, for it can only continue to deteriorate as its scarcity controls become increasingly inadequate. This reduces the choice to one — the leadership of the scientists, technologists and engineers who made abundance possible and are competent to operate a scientific social mechanism specifically designed to distribute that abundance.

The continued existence of all North Americans depends upon a successful transition from the Price System, when it can no longer operate, to the non-price Technate. Whether or not this is accomplished depends in turn upon how quickly and effectively North Americans change their conformity habits from following the defunct leadership of the past to demanding the functional leadership of the future.

—Rupert N Urquhart

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* LONDON—The headquarters of the Royal Society, which soon will be equipped to relay telephone conversations around the world by bouncing signals off earth-girdling satellites, is unable to get an ordinary telephone for local use. A spokesman said the telephone company had told him the society was 'halfway down a long waiting list.'

—UNITED PRESS INTERNATIONAL

End Of Toil

EDITOR'S NOTE: In this article Gerard Piel, editor and publisher of 'Scientific American,' outlines some distribution problems arising from the elimination of toil. Despite some intrusion of faulty Price System concepts, his general analysis closely parallels Technocracy's. He concludes that some other standard of social accounting (than the Price System) might serve better to reduce waste and inefficiency.

THE ADVANCE of science has for many years been undermining the two pillars of our economy: property and work. The ownership of property is no longer the primary source of power, even economic power, in our society; nor does ownership establish the significant, functioning connection between people and the things they consume. Work occupies fewer hours in the lives of everyone; what work there is grows less like work every year, and the less the people work the more their production grows. In the place of work and property, illusions and old habits and compulsions now support the social edifice. Public understanding must eventually overtake this transformation in the relationship of modern man to his physical environment. Fundamental changes in the social order — in man's relationship to man — are therefore in prospect and are already in process.

Until quite recent times, land was the only economically significant property physically occupied by its possessors and cherished and maintained from generation to generation. In medieval Europe the land so completely dominated economic life that the taking of interest was synonymous with usury, a crime as well as a sin. It took a religious revolution to establish the practice of selling things for more than they cost and to secure propriety for profit in the worldly virtue of thrift.

Profit, thrift and the accumulation of capital brought an entirely new kind of property into

(Reprinted from The Nation)

ascendance — the machine, which at first had the same immemorial look of permanence as the land. It embodied a high ratio of brute material to design, and was built for depreciation over at least one generation of ownership. It was not long, however, before the ratio of design to material began to rise; finally, the ratio was reversed. As the machine became even less substantial, its lifetime grew shorter. Today the economically significant industrial property is not the machine, but the design — and not even the design so much as the capacity to innovate design in process and product. This is scarcely property at all; rather, it is the capacity of an organization. To have that capacity encumbered by gigantic plant can be hazardous. The most profitable manufacturing enterprises are those that show a shrinking ratio of plant to output and a rising ratio of instrumentation to plant. The decisive factor of production today is research and development.

As the nature of property, in the sense of the thing that is owned, has changed, so has the nature of the social institution of property. Property was subverted by another social institution: the corporation. With ownership represented by stock certificates, the proprietors ceased to occupy the premises, and their rights were reduced to voting for the directors of the corporation (if they bothered to return the proxy statement) and to a claim on earnings (if the directors declare dividends).

A similar transformation in the nature of property is to be seen in the relationship of the owner to property as usufruct. There is a greater percentage of home-owners today in the United States than ever before in this century — more than 60 per cent of the occupiers of dwelling places compared to less than 50 per cent in 1900. But whereas 30 per cent of the homes were mortgaged to 40 per cent of their aggregate value in 1900, more than 60 per cent are mortgaged to an aggregate of more than half their value today. The builders and bankers of the new suburbs will tell you that the ownership of one out

of six homes there turns over every year. Plainly, the so-called home-owner is buying not a home but a housing service, much as he buys transportation, not a car, from the auto industry. In sum, the typical U.S. consumer owns no property in the classical meaning of the term. Out of current income he pays for services currently rendered. Through income set aside in social security taxes and in pension and insurance funds, he reserves a claim on services to be rendered in the future.

The subversion of work has followed a parallel course. Work now serves to secure not the production, but the distribution, of goods in our economy. The subversion of work began, of course, with the displacement of manpower by the horsepower first of steam engines and then of steam turbines, the generator of electrical energy. Studies conducted many years ago, when muscles were yielding a day's work to steam, showed that one man can put out about forty-eight kwh. in useful work in a year. On that basis, the 750 billion kwh. of electricity generated in the United States puts the equivalent of eighty-five slaves at the disposal of each man, woman and child.

But this is an old story. The new story is the disemployment of the human nervous system. The robot, or artificial nervous system which is replacing the human one, is based on a single underlying principle: the 'feedback.' This principle underlies all self-regulating systems, including living organisms. The nearest and simplest example is the household thermostat, in which a mechanical sense organ absorbs a little of the heat generated by the household heating plant and thereby makes a measurement of its output. This small fraction of the output is fed back in the form of a signal to correct the input of fuel to the heating unit. By this feeding back of output to input, the household heating plant is made to regulate itself.

The feedback-control systems in our economy appear in a host of species and varieties — electrical, electronic, pneumatic, hydraulic, mechanical. An accurate census of them has not been made. But the evidence is strong that they now out-

number the human workers employed in industry. Our entire energy economy — from the steam plant out across the high-tension lines to the rotating machinery of industry — is now subject to automatic control. The new technology of atomic energy is critically dependent upon automatic control. Our petroleum refineries and almost all of our chemical process plants are today so highly robotized that their complex operations are controlled by one or two human operators stationed at the central push-button control panel.

It is only a few steps from here to the fully automatic factory. In fact, the first full-scale petroleum refineries incorporating the principal elements of the self-regulating robot factory are already on the way.

Obviously, the purpose in designing an automatic petroleum refinery is not to replace the one or two human operators who still remain on the payroll, any more than the dial telephone, with the ramifications of direct long-distance and direct inward dialing, is designed to save the wages of operators. In both instances, the object is increased efficiency. The heart of the modern telephone system is not the dial, but a computer in the central station known in the telephone company as the 'line marker.' Its self-regulating internal circuit is so complex that its designers cannot tell at any given moment just which elements in it are performing the work at hand. At the present rate of traffic, the American Telephone and Telegraph Company estimates it would have to employ all of the women in the labor force, plus 20 per cent more, to do the work of its line markers. The task of coordinating the output of that many human nervous systems in a single telephone system is quite impracticable.

Since the computer's function is to handle information, the easiest way to hook it up to the world outside it is by typewriter. Equipped with typewriters, it becomes a white-collar worker.

Thus far the impact of the automatic - control revolution upon the industrial payroll has been felt most acutely by the

production worker. Until about twenty-five years ago, the ranks of skilled and semi-skilled factory hands were the growing element in the labor force; now their numbers are declining at an accelerating rate. During the three-year period, from 1956 to 1959, for example, the General Electric Company increased its output by 6 per cent and at the same time reduced its production payroll by 10 per cent. That company's non-production workers now outnumber the factory payroll proper. The same is apparently true of other major units in the electrical industry. After the last retooling, the auto industry produced more units than ever before — and with fewer production workers, as the shrinking rolls of the auto workers union attest.

Vocal union organizations imbued with the Luddite spirit have made the public uncomfortably aware of these developments in recent years. Less is heard of what must be the already considerable impact of the white-collar computer, which has only begun to be felt. Clearly, the liberation of white-collar workers from their routines is due to proceed at a much faster rate.

From decade to decade, the U.S. economy has adjusted to the obviation of work with something of the same inventiveness with which it has absorbed the consequences of the subversion of property. One man-hour of work today produces what it took three man-hours to produce sixty years ago. This means that we could be producing the same national product as in 1900 with one-third of the 1900 labor force. That would leave 58 million members of the present labor force unemployed. But, of course we have elected to apply our rising productivity to the production of a much large volume of goods (about six times as much as in 1900). A major part of this vast increase is represented by products not dreamed of in 1900.

Workers could be producing goods in even greater volume, but they have chosen to take a substantial portion of the gain in leisure. With the work week shortened from around sixty hours to forty, the much larger

1961 labor force is putting in a total number of man-hours that is only 40 per cent larger than that worked by the 1900 labor force. If the sixty-hour work week still prevailed, only 40 million workers would be needed to produce the 1961 national product and some 27 million workers would be unemployed.

This invention — the spreading of the same amount of work over the larger labor force by giving everyone less work to do — constitutes only a part of the solution to the problem of distribution. Moreover, it should be distinguished from the desperate share-the-work measures taken in the Great Depression, because it does not involve sharing the wage.

On the contrary, the portion of the national income going to the labor factor (that is, compensation of employees as against profit, interest, rent and so on) has risen slowly from 53 to 73 per cent since 1900. This is another huge gain on the problem of distribution, especially when it is considered in connection with the way the total income is shared among the income groups. The lowest fourfifths received about one-third of the total national income in 1900; those income groups now receive 55 per cent of the very much larger total. Almost the entire 12 per cent subtracted from the income of the top fifth went to the three middle fifths, improving their relative position by roughly 60 per cent.

The redistribution of purchasing power is another important factor in reducing the amount of work people do in the course of their lives. It makes it possible for young people to postpone their entrance into the labor market through high school and even college age, and it takes workers out of the labor market by voluntary retirement at the other end of their careers.

But the shortening of the man-year and the working life still leaves untold the real story of how work has been spread in order to secure the spread of purchasing power. If work is defined with any sort of strictness to mean productive work — that is, the extraction of raw materials and the making of consumable goods from them — then less than half of the labor force, or only 25 million people,

are really at work. The distribution of the abundance they produce is secured in major part by employing people in the task of distribution. This is not to say that the distributors do not serve a valid economic function. But selling and distribution costs commonly mark up the manufacturing cost of durable goods by 250 per cent. The major portion of the profit on the sales price now comes from the distribution process. Since gimmickry is thus made to grow by what it feeds upon, the distribution system pays a premium on waste. Its principal economic justification is that it does provide 'work' and so increases the number of consumers.

To the round 12 million employed in distribution should be added another 12 million who qualify as consumers by virtue of their employment in financial, clerical and service functions—necessary, but again not productive work as it is formally defined in our national bookkeeping.

Another large group of consumers is qualified by their enrollment on government payrolls. Certain members of the community will stoutly deny that these people ever do a day's work. Not counting the armed forces, their number now exceeds 5.5 million. If the figure looks too big, it is because we usually forget local and state governments in these calculations. It comes back into scale when we recognize that $132 billion, nearly 30 per cent of the gross national product, turned over in government budgets in 1959. Those expenditures not only set up 5.5 million consumers for the goods made by those more productively employed; the money also made substantial direct purchases of goods and so generated millions of the jobs in the production sector.

Our roll call ends with the two million-odd household employees and the two or more million who are employed in teaching or self-employed in the learned professions. Those whom we have here classified as nonproductive employees constituted only 30 per cent of the labor force of 1900; they make up 60 per cent of it today. Compared to the day's work that confronts

most of mankind every morning, most U.S. citizens are not engaged in work at all.

Thus, up to the present, the American society has managed to handle the obviation of work without undue stress upon the system of distribution that has carried over from the days of scarcity. It now appears, however, that the advance of technology has begun to outstrip our capacity for social invention. Before the Second World War, in the flux of technological change and the oscillations of the business cycle, the system chronically fell 5 to 10 per cent below full employment and fell as far as 25 per cent below in 1933. It is instructive to compare this experience with the present. During the past several years, despite a steady rise in gross national product, unemployment has been rising. It now approaches six million, or nearly 10 per cent of the labor force. But this figure seriously understates the gap between the jobs available in the production and distribution of goods in the economy and the number of people who need employment in order to be able to purchase their share of those goods.

That gap has been filled for the past fifteen years by the war economy. Today's roll of the employed includes 2.5 million in the armed forces; they are certainly not employed in the production and distribution of goods. To their numbers should be added the one million civilian employees of the Department of Defense, whose principal employment is that of housekeeping and procurement for those in uniform. Finally, we must add the 2.5 million workers in industry engaged in filling the procurement orders of the military. The total of those unemployed and employed outside the civilian economy thus comes to 12 million — close to 20 per cent of the labor force and only 5 per cent below the unemployment peak of 1933. And this at a time when the gross national product has reached an all-time high.

Wassily Leontief of Harvard University recently applied his 'input-output' technique to a study of the economics of disarmament. His tables indicate that even if the gross national

product is maintained at peak levels through the transition period following an agreement to disarm, the civilian economy would very likely fall short of re-employing all those who would be disemployed by a cut in military expenditure. The same study indicates that by 1965 technological disemployment will, in any case, eliminate about one-fifth of the jobs in industry now generated by the procurement of arms. In other industries, in the same period, technological progress promises to reduce employment by an average of close to 10 per cent.

The evidence that full employment is no longer an attainable objective seems to be growing. Of course, the arms budget can be arbitrarily increased, and the size of the armed forces along with it, to offset technological disemployment in the armament industries. But no one really wants to contemplate an indefinite continuation of the arms race. Alternatively, or concurrently, some of the slack can be taken up by a thirty-hour week, a measure advocated by both Presidential candidates as long ago as 1956. After that, the work week could be reduced to twenty-five, then twenty hours — the inefficiency of the ultra-short work week will itself help to create more jobs. At that point the nation will have come really close to being a workless society.

No reasonably predictable rate of growth of the gross national product seems equal to overtaking the current rate of technological disemployment. Every step of progress in automatic control reduces the capital investment as well as the employment per unit of output. As the cost of investment goes down, the rate of technological progress and consequent disemployment must increase. Even an expanding economy must employ progressively fewer workers in its production sector. At some point, the terminus of full investment will be reached; at the present level of opulence, the consumer economy already shows signs of surfeit. There is, of course, a vast untapped market in the income groups at the bottom third of the economic pyramid. But how are their wants to be implemented with purchasing power when that

bottom third already counts the disemployed among its members?

In the long run, larger questions must be faced and answered. If a fraction of the labor force is capable of supplying an abundance of everything the population needs and wants, then why should the rest of the poulation have to work for a living? Preposterous alternatives suggest themselves: the cash registers might simply be removed from the counters in the supermarkets. If production cannot be maintained at a profit under such circumstances then why should a profit be made? Some other standard of social accounting might serve even better to reduce waste and inefficiency.

These questions are put in a deliberately extreme form. They suggest the kind of overturn in the values of our society that is already quaking the ground beneath our feet. The virtues of thrift, hard work and profit are rooted in scarcity. With the middle-income family typically in hock to installment-purchase contracts and with the private-money market supplying less than 2 per cent of the new capital in our economy, thrift long ago ceased to serve a significant economic function.

Any hard work that a machine can do is better done by a machine; 'hard' these days means mostly boring and repetitive, whether in the factory or office. But the instinct for workmanship, the need to feel needed, the will to achieve are deeply felt in every human heart. They are not universally fulfilled by the kind of employment most people find. The liberation from tasks unworthy of human capacity could free that capacity for a host of activities now neglected in our culture: learning and teaching, the sciences, arts and letters, the crafts, medicine and its allied works, politics and public service. The Peace Corps now being created suggests that disemployed factory workers might be mobilized in cadres to find rewarding employment in teaching their skills to citizens of the poor nations still on the threshold of their industrial revolution. Characteristically, the new kinds of employment that open up to people involve their inter-

action with other people, rather than with things.

As for profit, a great many of the most vital activities in our society — teaching and the best kind of medicine, fundamental scientific investigation, conservation and the enhancement of resources, city planning, public works, urban rapid transit, symphony orchestras, the operation of museums — have never been or can no longer be conducted at a profit. Most of these activities and institutions are now short-changed. With abundance to support the portion of the labor force employed in them, it can be anticipated that they will gain a higher priority in our lives. In activities that are carried on for a profit, considerations other than profit are already being pressed upon the great corporations by society through governmental regulatory agencies.

What is most to be asked of the corporate enterprise system is the diffusion of initiative in the promotion of technological progress. This, in fact, is the primary purpose served by profits in the industrial system today; as a kind of involuntary savings, extracted beforehand from the unthrifty consumer, retained corporate earnings have furnished the principal capital for industrial expansion for more than forty years.

Our society is probably closer to being propertyless than workless today. But the rate of technological progress is speeding up. It appears now to be moving faster than even the responsive and resilient U.S. social order can evolve. Some of the changes may have to come in quantum jumps. For these we need economic and political leadership whose judgment is not compromised by commitments to the past.

—Gerard Piel

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* HAMILTON, ONT. — Immigration Minister Ellen Fairclough told the graduating class of Hamilton Institute of Technology that the true revolutionaries of the 20th century are not Bolshevists or starry-eyed Fabians, but 'our scientists, engineers, technologists and technicians.' In the last three centuries many governments were overthrown by revolutions, but none of them, of themselves, substantially changed the material or physical well-being of the masses.

Mrs. Fairclough said the real revolution has been the technological one, which in the space of decades, reduced poverty, malnutrition and disease in most of North America and Western Europe and raised standards of living to unprecedented levels. —CANADIAN PRESS

Through the Technoscope . . .

Technocracy examines the various scientific and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

A PLASTIC SHOE LAST, SAID TO be the first to become available on a commercial scale, has been introduced by the Sterling Last Corporation of Long Island City, Queens, New York. The product, which has the trade name Sterlon, was described as supplying improvements not possible with the conventional wooden lasts that have been used in making footwear more than 2,000 years.

The last is highly important in manufacturing, since it is the form, shaped like a foot, over which the shoe is made. It plays a major role in determining the fit, shape, style and performance of the shoe. The plastic last was said to make possible greater precision, since wood shrinks and swells under the influence of moisture and temperature changes. Dimensional stability was said to be constant.

IT IS A BIT UNUSUAL TO FIND A power tool at work in open countryside — and a complete oddity to see one without a thick black electric cord attached. But this sight should become more common when a new 1/4-inch drill goes on the market in the fall. The drill, the first to use self-contained power, is the latest product of Black & Decker Mfg. Co., Towson, Md., one of the leading manufacturers of portable power tools.

The new drill is powered by nickel-cadmium batteries located in the pistol-grip handle and weighs only 4 lb. Yet it is powerful enough to drill holes in metal plates or thick wood boards in a few seconds. The company says its engineers are trying to apply the battery concept to several other types of portable power tools — saws, riveters, screwdrivers, hedge trimmers, and other construction and garden tools — useful on jobs where there's no convenient source of electricity nearby.

A NEW DRY PROCESS COPY machine can produce paper offset plates in 60 seconds from any kind of written, printed, or illustrated material. The original document is set in place on the machine and the photographing and developing are done automatically. Manfacturer is Robertson Photo-Mechanix, Inc., of Chicago.

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

* Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elswhere.

* The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

* It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

* Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

* There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Panama, Puerto Rico and in numerous other places with the Armed Forces.

* Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

* Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundation of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

* Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

* Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American you are welcome in Technocracy.

TECHNOCRACY

'. . . A NON-POLITICAL FACT-FINDING BODY OF EXPERTS IN THE VARIOUS DEPARTMENTS OF APPLIED AND THEORETICAL SCIENCES, WHOSE AIM IS TO REVALUATE INDUSTRIAL OUTPUT IN TERMS OF ENERGY FACTORS.'

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